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(54) **METHOD FOR PUSHING INFORMATION FROM A HOST SYSTEM TO A MOBILE DATA COMMUNICATION DEVICE**

VERFAHREN ZUM SCHIEBEN VON INFORMATION ZWISCHEN EINEM WIRTRECHNERSYSTEM UND EINEM MOBILEN DATENKOMMUNIKATIONSGERÄT

PROCEDE SERVANT A REDIRIGER DES INFORMATIONS ENTRE UN SYSTEME HOTE ET UN DISPOSITIF MOBILE DE COMMUNICATION DE DONNEES

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention is directed toward the field of redirecting information between a host system and a mobile data communication device.

2. Description of the Related Art

[0002] Present systems and methods for replicating information from a host system to a user's mobile data communication device are typically "synchronization" systems in which the user's data items are warehoused (or stored) at the host system for an indefinite period of time until the user synchronizes the mobile device to the host system. In these types of systems and methods, when replication of the warehoused data items to the mobile device is desired, the user typically places the mobile device in an interface cradle that is electrically connected to the host system via some form of local, dedicated communication, such as a serial cable or an infrared or other type of wireless link. Software executing on the mobile data communication device then transmits commands via the local communications link to the host system to cause the host to begin transmitting the user's data items for storage in a memory bank of the mobile device.

[0003] In these synchronization schemes, the mobile unit "pulls" the warehoused information from the host system in a batch-mode each time the user desires to replicate information between the two devices. Thus, the two systems (host and mobile) maintain the same data items only after a user-initiated synchronization sequence.

[0004] A general problem with these synchronization systems is the fact that the data in the mobile device is only current at the moment of synchronization with the host. Five minutes later a new message could be sent to the user, but the user would not receive that message until the next time the systems are synchronized. Thus, a user may fail to respond to an emergency update or message because the user only periodically synchronizes the system, such as once per day.

[0005] Other problems with these systems include: (1) the amount of data to be reconciled between the host and the mobile device can become large if the user does not "synchronize" on a daily or hourly basis, leading to bandwidth difficulties, particularly when the mobile device is communicating via a wireless packet-switched network; and (2) reconciling large amounts of data, as can accrue in these batch-mode synchronization systems, can require a great deal of communication between the host and the mobile device, thus leading to a more complex, costly and energy-inefficient system.

[0006] Thus, there is a general need in this field for a more automated, continuous, efficient, flexible, and reli-

able system of ensuring that user data items are replicated (in real time) at the user's mobile device.

[0007] In WO 99/63709 a redirection software is described being located at the desktop computer or the mobile device. This redirector operating at the mobile device does not redirect messages that have already been redirected from the server or desktop redirector to another location, but instead it is used to redirect messages received at the mobile device from an external source back to the desktop or server redirector.

[0008] The objective technical problem is to further improve the redirection method in order to improve its flexibility and to allow easy and efficient maintenance.

[0009] This technical problem is solved according to the features of the independent claim.

[0010] A system and method for pushing information from a host system to a mobile data communication device upon sensing a triggering event is provided. A redirector program operating at the host system enables a user to continuously redirect certain user-selected data items from the host system to the user's mobile data communication device upon detecting that one or more user-defined triggering events has occurred. The redirector program operates in connection with event generating applications and repackaging systems at the host system to configure and detect a particular user-defined event, and then to repackage the user-selected data items in an electronic wrapper prior to pushing the data items to the mobile device.

[0011] Using the redirector program, the user can select certain data items for redirection, such as E-mail messages, calendar events, meeting notifications, address entries, journal entries, personal reminders etc. Having selected the data items for redirection, the user can then configure one or more event triggers to be sensed by the redirector program, which then initiates redirection of the user data items upon sensing one or more of the event triggers. These user-defined trigger points (or event triggers) may be external events, internal events or networked events. Once an event has triggered redirection of the user data items, the host system then repackages these items in a manner that is transparent to the mobile data communication device, so that information on the mobile device appears similar to information on the user's host system.

[0012] The redirector program also provides a set of software-implemented control functions for determining the type of mobile data communication device and its address, for programming a preferred list of message types that are to be redirected, and for determining whether the mobile device can receive and process certain types of message attachments, such as word processor or voice attachments. The mobile device control functions are initially set by the user of the mobile device at the host system. These functions can then be altered on a global or per message basis by transmitting a command message from the mobile device to the host system.

[0013] In an alternative embodiment, the redirector program executes on a network server, and the server is programmed to detect numerous redirection event triggers over the network from multiple user desktop computers coupled to the server via a local-area-network ("LAN"). The server can receive internal event triggers from each of the user desktops via the network, and can also receive external event triggers, such as messages from the users' mobile data communication devices. In response to receiving one of these triggers, the server redirects the user's data items to the proper mobile data communication device. This alternative configuration could also include an Internet or Intranet-located web server including the redirector program that could be accessible through a secure Web page or other user interface. In this configuration, the redirector program could be located on an Internet Service Provider's ("ISP's") system, and the user would configure (and reconfigure) the program controls over an Internet connection to the ISP's system.

[0014] In another embodiment, the redirector program operates at both the host system and at the user's mobile data communication device. In this configuration, the user's mobile device operates similarly to the host system described below, and is configured in a similar fashion to push certain user-selected data items from the mobile device to the user's host system (or some other computer) upon detecting an event trigger at the mobile device. This configuration provides two-way pushing of information from the host to the mobile device and from the mobile device to the host.

[0015] The primary advantage of the present invention is that it provides a system and method for triggering the continuous and real-time redirection of user-selected data items from a host system to a mobile data communication device. Other advantages of the present invention include: (1) flexibility in defining the types of user data to redirect, and in defining a preferred list of message types that are to be redirected or preferred senders whose messages are to be redirected; (2) flexibility in configuring the system to respond to numerous internal, external and networked triggering events; (3) transparent repackaging of the user data items in a variety of ways such that the mobile data communication device appears as though it were the host system; (4) integration with other host system components such as E-mail, TCP/IP, keyboard, screen saver, Web pages and certain programs that can either create user data items or be configured to provide trigger points; and (5) the ability to operate locally on a user's desktop system or at a distance via a network server or through a secure Internet connection.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The present invention satisfies the needs noted above as will become apparent from the following description when read in conjunction with the accompanying drawings wherein:

FIG. 1 is a system diagram showing the redirection of user data items from a user's desktop PC (host system) to the user's mobile data communication device, where the redirector software is operating at the user's desktop PC;

FIG. 2 is a system diagram showing the redirection of user data items from a network server (host system) to the user's mobile data communication device, where the redirector software is operating at the server;

FIG. 3 is a block diagram showing the interaction of the redirector software with other components of the host system in FIG. 1 (the user's desktop PC) to enable the pushing of information from the host system to the user's mobile data communication device;

FIG. 4 is a flow chart showing the steps carried out by the redirector software operating at the host system;

FIG. 5 is a flow chart showing the steps carried out by the mobile data communication device to interface with the redirector software operating at the host system;

FIG. 6 is a system diagram showing the redirection of user data items from a user's host system to the user's mobile data communication device, where the redirector software is operating at the wireless redirector host system;

FIG. 7 is a block diagram showing the interaction of the redirector software with other components of the host system in FIG. 6 to enable the pushing of information from the host system to the user's mobile data communications device;

FIG. 8 is a flow chart showing the steps carried out by the redirector software operating at the wireless redirector host system.

FIG. 9 is a block diagram showing the interaction of the redirector send agent software with other components of the host systems to enable the pushing of information from the host system to the user's mobile data communications device;

FIG. 10 is a block diagram showing the interaction of the redirector receive agent software with other components of the host systems to enable the pushing of information to the Internet from the user's mobile data communications device;

FIG. 11 is a flowchart showing the steps carried out by the redirector receive agent operating at the redirector agent host server in the case of redirecting email messages with domain-messaging and tag line customisation; and

FIG. 12 is a hierarchical view of an example of the different types of domains, represented by sites, which can interface with a single redirector system.

DETAILED DESCRIPTION OF THE DRAWINGS

[0017] Referring now to the drawings, FIG. 1 is an example system diagram showing the redirection of user

data items (such as message A or C) from a user's desktop PC (host system) 10A to the user's mobile data communication device 24, where the redirector software 12 is operating at the user's PC 10A. As used in this application, the term "host system" refers to the computer where the redirector software is operating. In the preferred embodiment, the host system is a user's desktop PC 10A. Alternatively, however, the host system could be a network server (10B, see FIG. 2) connected to the user's PC via a local-area network ("LAN"), or it could be a Web server (240, see FIG. 6) operating through a secure network connection or operating at an external ISP, or the host system could be any other system that is capable of communicating with the user's desktop PC.

[0018] Message A in FIG. 1 represents an internal message sent from desktop 26 to the user's host system 10A via LAN 14. Message C in FIG. 1 represents an external message from a sender that is not directly connected to LAN 14, such as the user's mobile data communication device 24, some other user's mobile device (not shown), or any user connected to the Internet 18. Message C also represents a command message from the user's mobile data communication device 24 to the host system 10A. As described in more detail in FIG. 3, the desktop host system 10A preferably includes, along with the typical hardware and software associated with a workstation or desktop computer, the redirector program 12, a TCP/IP subsystem 42, a primary message store 40, an E-mail subsystem 44, a screen saver subsystem 48, and a keyboard subsystem 46.

[0019] In FIG. 1, the host system 10A is the user's desktop system, typically located in the user's office. The desktop host system 10A is connected to a LAN 14, which also connects to other computers 26, 28 that may be in the user's office or elsewhere. The LAN 14, in turn, is connected to a wide area network ("WAN") 18, preferably the Internet, which is defined by the use of the Transmission Control Protocol/Internet Protocol ("TCP/IP") to exchange information, but which, alternatively, could be any other type of WAN. The connection of the LAN 14 to the WAN 18 is via high bandwidth link 16, typically a T1 or T3 connection. The WAN 18 in turn is connected to a variety of gateways 20, via connections 32. A gateway forms a connection or bridge between the WAN 18 and some other type of network, such as an RF wireless network, cellular network, satellite network, or other synchronous or asynchronous land-line connection.

[0020] In the example of FIG. 1, a wireless gateway 20 is connected to the Internet for communicating via wireless link 22 to a plurality of wireless mobile data communication devices 24. Also shown in FIG. 1 is machine 30, which could be a FAX machine, a printer, a system for displaying images (such as video) or a machine capable of processing and playing audio files, such as a voice mail system.

[0021] The present invention includes the ability to redirect certain message attachments to such an external machine 30 if the redirector program configuration data

reflects that the mobile device 24 cannot receive and process the attachments, or if the user has specified that certain attachments are not to be forwarded to mobile device 24, even if such device can process those attachments. By way of example, consider an E-mail sent to a user that includes three attachments -- a word processing document, a video clip and an audio clip. The redirection program 12 could be configured to send the text of the E-mail to the remote device 24, to send the word processing document to a networked printer located near the user, to send the video clip to a memory store accessible through a secure connection through the internet and to send the audio clip to the user's voice mail system. This example is not intended to limit the breadth and scope of the invention, but rather to illustrate the variety of possibilities embodied in the redirection concept.

[0022] The preferred mobile data communication device 24 is a hand-held two-way wireless paging computer, a wirelessly enabled palm-top computer, a mobile telephone with data messaging capabilities, or a wirelessly enabled laptop computer, but could, alternatively be other types of mobile data communication devices capable of sending and receiving messages via a network connection 22. Although it is preferable for the system to operate in a two-way communications mode, certain aspects of the invention could be beneficially used in a "one and one-half" or acknowledgment paging environment, or even with a one-way paging system. The mobile data communication device 24 includes software program instructions that work in conjunction with the redirector program 12 to enable the seamless, transparent redirection of user-selected data items. FIG. 4 describes the basic method steps of the redirector program 12, and FIG. 5 describes the steps of the corresponding program operating at the mobile device 24.

[0023] In an alternative embodiment of the present invention, not explicitly shown in the drawings, the mobile device 24 also includes a redirector program. In this embodiment, user selected data items can be replicated from the host to the mobile device and vice versa. The configuration and operation of the mobile device 24 having a redirector program is similar to that described herein with respect to FIGs. 1-4.

[0024] A user of the present invention can configure the redirector program 12 to push certain user-selected data items to the user's mobile data communication device 24 when the redirector 12 detects that a particular user-defined event trigger (or trigger point) has taken place. User-selected data items preferably include E-mail messages, calendar events, meeting notifications, address entries, journal entries, personal alerts, alarms, warnings, stock quotes, news bulletins, etc. Alternatively, the user-selected data items could include any other type of message that is transmitted to the host system 10A, or that the host system 10A acquires through the use of intelligent agents, such as data that is received after the host system 10A initiates a search of a database, a Web site or a bulletin board. In some instances, only a portion

of the data item is transmitted to the mobile device 24 in order to minimize the amount of data transmitted via the wireless network 22. In these instances, the mobile device 24 can optionally send a command message (C) to the host system 10A to retrieve more or all of the data item if the user desires to receive it.

[0025] The user-defined event triggers include external events, internal events and networked events. External events preferably include: (1) receiving a command message (such as message C) from the user's mobile data communication device to begin redirection, or to execute some other command at the host, such as a command to enable the "preferred list mode" (described below), or to add or subtract a particular sender from the preferred list of the preferred list mode; (2) receiving a similar message from some external computer; and (3) sensing that the user is no longer in the vicinity of the host system; although, alternatively, an external event can be any other detectable occurrence that is external to the host system 10.

[0026] Internal events may include a calendar alarm, screen saver activation, keyboard timeout, programmable timer, or any other user-defined event that is internal to the host system 10. Networked events are user-defined messages that are transmitted to the host system from another computer coupled to the host system 10A via a network to initiate redirection. These are just some of the event triggers that could be used with the present invention to initiate replication of the user-selected data items from the host system 10A to the mobile device 24. Other types of triggers are also within the scope of the present invention.

[0027] FIG. 1 shows an E-mail message A being communicated over LAN 14 from computer 26 to the user's desktop system 10A (also shown in FIG. 1 is an external message C, which could be an E-mail message from an Internet user, or could be a command message from the user's mobile device 24). Once the message A (or C) reaches the primary message store of the host system 10A, it can be detected and acted upon by the redirection software 12. The redirection software 12 can use many methods of detecting new messages. The preferred method of detecting new messages is using Microsoft's® Messaging API ("MAPI"), in which programs, such as the redirector program 12, register for notifications or 'advise syncs' when changes to a mailbox take place. Other methods of detecting new messages could also be used.

[0028] Assuming that the redirector program 12 is activated, and has been configured by the user (either through the sensing of an internal, external, or networked event) to replicate certain user data items (including messages of type A or C) to the mobile device 24, when the message A is received at the host system 10A, the redirector program 12 detects its presence and prepares the message for redirection to the mobile device 24. In preparing the message for redirection, the redirector program 12 may compress the original message A, it may just compress the message header, or it may encrypt the

entire message A to create a secure link to the mobile device 24.

[0029] The address of the user's mobile data communication device 24, the type of device, and whether the device 24 can accept certain types of attachments, such as word processing or voice attachments, are also programmed into the redirector 12. If the user's type of mobile device cannot accept a particular type of attachments, then the redirector 12 can be programmed to route those attachments to a fax or voice number where the user is located using an attached fax or voice machine 30.

[0030] The redirector 12 may also be programmed with a "preferred list mode" operation that is configured by the user either at the host system 10A, or remotely from the user's mobile data communication device 24 by transmitting a command message C. The "preferred list" in the "preferred list mode" contains a list of senders (other users) whose messages are to be redirected, or it may contain a list of message characteristics that determine whether a message is to be redirected, or it may contain both a list of senders and a list of message characteristics. For example, a message characteristic may relate to the size of the message, or the type of message, or whether the message has any attachments, or whether the message is originating from a particular domain. If activated, the preferred list mode causes the redirector program 12 to operate like a filter, only redirecting certain user data items based on whether the data item was sent from a sender on the preferred list or has certain message characteristics that if present will trigger or suppress redirection of the message.

[0031] In the example of FIG. 1, if desktop system 26 was operated by a user on the preferred list of host system 10A, and the preferred list option was activated, then message A would be redirected. If, however, desktop 26 was operated by a user not on the host system's preferred list, then message A would not be redirected, even if the user of the host system had configured the redirector to push messages of type A. The user of the host system 10A can configure the preferred list directly from the desktop system 10A, or, alternatively, the user can send a command message (such as C) from the mobile device 24 to the desktop system 10A to activate the preferred list mode, or to add or delete certain senders or message characteristics from the previously configured preferred list. In this manner, the user can remotely control the operation of the preferred list mode filter so as to dynamically alter the filtering characteristics of the redirector program 12.

[0032] After the redirector 12 has determined that a particular message should be redirected, and it has prepared that message for redirection, the software 12 then sends the message A to a secondary memory store located in the mobile device 24. In doing so, the redirector preferably repackages message A as an E-mail with an outer envelope B that contains the addressing information of the mobile device 24, although alternative repackaging techniques and protocols could be used, such as

a TCP/IP repackaging and delivery method (most commonly used in the alternative server configuration shown in FIG. 2). The wireless gateway 20 requires this outer envelope information B in order to know where to send the redirected message A. Once the message (A in B) is received by the mobile device 24, the outer envelope B is removed, and the original message A is placed in the secondary memory store within the mobile device 24. By repackaging and removing the outer envelope in this manner, the present invention causes the mobile computer 24 to appear to be at the same physical location as the host system 10, thus creating a transparent system.

[0033] In the case where message C is representative of an external message from a computer on the Internet 18 to the host system 10A, and the host 10A has been configured to redirect messages of type C, then in a similar manner to message A, message C would be repackaged with an outer envelope B and transmitted to the user's mobile device 24. In the case where message C is representative of a command message from the user's mobile device 24 to the host system 10A, the command message C is not redirected, but is acted upon by the host system 10A.

[0034] If the redirected user data item is an E-mail message, as described above, the user at the mobile device 24 sees the original subject, sender's address, destination address, carbon copy and blind carbon copy information. When the user replies to this message, or when the user authors a new message, the software operating at the mobile device 24 adds a similar outer envelope to the reply message (or the new message) to cause the message to be routed first to the user's host system 10A, which then removes the outer envelope and redirects the message to the final destination, such as back to computer 26. In the preferred embodiment, this results in the outgoing redirected message from the user's host system 10A being sent using the E-mail address of the host mailbox, rather than the address of the mobile device, so that it appears to the recipient of the message that the message originated from the user's desktop system 10A rather than the mobile data communication device 24. Any replies to the redirected message will then be sent to the desktop system 10A, which if it is still in redirector mode, will repackage the reply and re-send it to the user's mobile data device 24, as described above.

[0035] FIG. 2 is an alternative system diagram showing the redirection of user data items from a network server host system 10B to the user's mobile data communication device 24, where the redirector software 12 is operating at the server 10B. This configuration is particularly advantageous for use with message servers such as Microsoft's® Exchange Server, which is normally operated so that all user messages are kept in one central location (or mailbox store) on the server instead of in a memory store within each user's desktop PC. This configuration has the additional advantage of allowing a single system administrator to configure and keep track of all users hav-

ing messages redirected. If the system includes encryption keys, these too can be kept at one place for management and update purposes.

[0036] In this alternative configuration, server 10B preferably maintains a user profile for each user's desktop system 26, 28, including information such as whether a particular user can have data items redirected, which types of message and information to redirect, what events will trigger redirection, the address of the users' mobile data communication device 24, the type of mobile device, and the user's preferred list, if any. The event triggers are preferably detected at the user's desktop system 26, 28 and can be any of the internal, external or networked events listed above. The desktop systems 26, 28 preferably detect these events and then transmit a message to the server host computer 10B via LAN 14 to initiate redirection. Although the user data items are preferably stored at the server host computer 10B in this embodiment, they could, alternatively, be stored at each user's desktop system 26, 28, which would then transmit them to the server computer 10B after an event has triggered redirection.

[0037] As shown in FIG. 2, desktop system 26 generates a message A that is transmitted to and stored at the host system 10B, which is the network server operating the redirector program 12. The message A is for desktop system 28, but in this embodiment, user messages are stored at the network server 10B. When an event occurs at desktop system 28, an event trigger is generated and transmitted to the network server 10B, which then determines who the trigger is from, whether that desktop 28 has redirection capabilities, and if so, the server 10B (operating the redirector program 12) uses the stored configuration information to redirect message A to the mobile computer 24 associated with the user of desktop system 28.

[0038] As described above with reference to FIG. 1, message C could be either a command message from a user's mobile data communication device 24, or it could be a message from an external computer, such as a computer connected to the Internet 18. If the message C is from an Internet computer to the user's desktop system 28, and the user has redirection capabilities, then the server 10B detects the message C, repackages it using electronic envelope B, and redirects the repackaged message (C in B) to the user's mobile device 24. If the message C is a command message from the user's mobile device 24, then the server host computer 10B simply acts upon the command message using the redirector program 12.

[0039] Turning now to FIG. 3, a block diagram is set forth that demonstrates the interaction of the redirector software 12 with additional components of the desktop host system 10A shown in FIG. 1 (i.e., the desktop PC) to enable more fully the pushing of information from the host system 10A to the user's mobile data communication device 24. These additional components are illustrative of the type of event-generating systems that can be

configured and used with the redirector software 12, and of the type of repackaging systems that can be used to interface with the mobile communication device 24 to make it appear transparent to the user.

[0040] The desktop host system 10A is connected to LAN 14, and can send and receive data, messages, signals, event triggers, etc., to and from other systems connected to the LAN 14. Through the LAN, the system 10A can also communicate with external networks 18, 22, such as the Internet or a wireless data network. In addition to the standard hardware, operating system, and application programs associated with a typical microcomputer or workstation, the desktop system 10A includes the redirector program 12, a TCP/IP sub-system 42, an E-mail sub-system 44, a primary data storage device 40, a screen saver sub-system 48, and a keyboard sub-system 46. The TCP/IP and E-mail subsystems 42, 44 are examples of repackaging systems that can be used to achieve the transparency of the present invention, and the screen saver and keyboard sub-systems 46, 48 are examples of event generating systems that can be configured to generate event messages or signals that trigger redirection of the user selected data items.

[0041] The method steps carried out by the redirector program 12 are described in more detail in FIG. 4. The basic functions of this program are: (1) to configure and setup the user-defined event trigger points that will start redirection; (2) to configure the types of user data items for redirection and optionally configure a preferred list of senders whose messages are to be redirected; (3) to configure the type and capabilities of the user's mobile data communication device; (4) to receive messages and signals from the repackaging systems and the event generating systems; and (5) to command and control the redirection of the user-selected data items to the mobile data communication 24 device via the repackaging systems. Other functions not specifically enumerated could also be integrated into this program.

[0042] The E-Mail sub-system 44 is the preferred link to repackaging the user-selected data items for transmission to the mobile data communication device 24, and preferably uses industry standard mail protocols, such as SMTP, POP, IMAP, MIME and RFC-822, to name but a few. The E-Mail sub-system 44 can receive messages A from external computers on the LAN 14, or can receive messages C from some external network such as the Internet 18 or a wireless data communication network 22, and stores these messages in the primary data store 40. Assuming that the redirector 12 has been triggered to redirect messages of this type, the redirector detects the presence of any new messages and instructs the E-Mail system 44 to repackage the message by placing an outer wrapper B about the original message A (or C), and by providing the addressing information of the mobile data communication device 24 on the outer wrapper B. As noted above, this outer wrapper B is removed by the mobile device 24, and the original message A (or C) is then recovered, thus making the mobile device 24 appear to

be the desktop system 10A.

[0043] In addition, the E-Mail sub-system 44 receives messages back from the mobile device 24 having an outer wrapper with the addressing information of the desktop system 10A, and strips this information away so that the message can be routed to the proper sender of the original message A (or C). The E-Mail sub-system also receives command messages C from the mobile device 24 that are directed to the desktop system 10A to trigger redirection or to carry out some other function. The functionality of the E-Mail sub-system 44 is controlled by the redirector program 12.

[0044] The TCP/IP sub-system 42 is an alternative repackaging system. It includes all of the functionality of the E-Mail sub-system 44, but instead of repackaging the user-selected data items as standard E-mail messages, this system 42 repackages the data items using special-purpose TCP/IP packaging techniques. This type of special-purpose sub-system is useful in situations where security and improved speed are important to the user. The provision of a special-purpose wrapper that can only be removed by special software on the mobile device 24 provides added security, and by bypassing E-mail store and forward systems, the speed of delivery of messages can be improved.

[0045] As described previously, the present invention can be triggered to begin redirection upon detecting numerous external, internal and networked events, or trigger points. Examples of external events include: receiving a command message from the user's mobile data communication device 24 to begin redirection; receiving a similar message from some external computer; sensing that the user is no longer in the vicinity of the host system; or any other event that is external to the host system. Internal events could be a calendar alarm, screen saver activation, keyboard timeout, programmable timer, or any other user-defined event that is internal to the host system. Networked events are user-defined messages that are transmitted to the host system from another computer that is connected to the host system via a network to initiate redirection. Sensing that the user is not in the vicinity of the host system may be achieved by (1) an electronic camera subsystem that detects whether the user has left a predetermined area; (2) heat sensors that detects the lack of the user's heat presence; (3) motion detector that monitors if the user has not created any motion for a predetermined period of time; (4) disconnection or detachment of the mobile device from a serial cradle connected to the desktop computer or host system (prior to the mobile device user departing, user would remove the device from a serial cradle that permits a serial synchronization of the data on the mobile with that in the host system); and, (5) short-range RF detachment to the mobile device worn by the user as he departs the vicinity of the host system.

[0046] The screen saver and keyboard sub-systems 46, 48 are examples of systems that are capable of generating internal events. Functionally, the redirector pro-

gram 12 provides the user with the ability to configure the screen saver and keyboard systems so that under certain conditions an event trigger will be generated that can be detected by the redirector 12 to start the redirection process. For example, the screen saver system can be configured so that when the screen saver is activated after, for example, 10 minutes of inactivity on the desktop system, an event trigger is transmitted to the redirector 12, which starts redirecting the previously selected user data items. In a similar manner, the keyboard sub-system can be configured to generate event triggers when no key has been depressed for a particular period of time, thus indicating that redirection should commence. These are just two examples of the numerous application programs and hardware systems internal to the host system 10A that can be used to generate internal event triggers.

[0047] FIGs. 4 and 5, set forth, respectively, flow charts showing the steps carried out by the redirector software 12 operating at the desktop host system 10A, and the steps carried out by the mobile data communication device 24 in order to interface with the host system. Turning first to FIG. 4, at step 50, the redirector program 12 is started and initially configured. The initial configuration of the redirector 12 includes: (1) defining the event triggers that the user has determined will trigger redirection; (2) selecting the user data items for redirection; (3) selecting the repackaging sub-system, either standard E-Mail, or special-purpose technique; (4) selecting the type of data communication device, indicating whether and what type of attachments the device is capable of receiving and processing, and inputting the address of the mobile device 24; and (5) configuring the preferred list of user selected senders whose messages are to be redirected.

[0048] FIG. 4 sets forth the basic steps of the redirector program 12 assuming it is operating at a desktop host system 10A, such as shown in FIG. 1. If the redirector 12 is operating at a network server host system 10B, as shown in FIG. 2, then additional configuration steps may be necessary to enable redirection for a particular desktop system 26, 28 connected to the server 10B, including: (1) setting up a profile for the desktop system 26, 28 indicating its address, events that will trigger redirection, and the data items that are to be redirected upon detecting an event; (2) maintaining a storage area at the server 10B for the data items; and (3) storing the type of data communication device 24 to which the desktop system's data items are to be redirected, whether and what type of attachments the device 24 is capable of receiving and processing, and the address of the mobile device 24.

[0049] Once the redirector program is configured 50, the trigger points (or event triggers) are enabled at step 52. The program 12 then waits 56 for messages and signals 54 to begin the redirection process. A message could be an E-Mail message or some other user data item that may have been selected for redirection, and a signal could be a trigger signal, or could be some other type of signal that has not been configured as an event trigger.

When a message or signal is detected, the program determines 58 whether it is one of the trigger events that has been configured by the user to signal redirection. If so, then at step 60 a trigger flag is set, indicating that subsequently received user data items (in the form of messages) that have been selected for redirection should be pushed to the user's mobile data communication device 24.

[0050] If the message or signal 54 is not a trigger event, the program then determines at steps 62, 68 and 66 whether the message is, respectively, a system alarm 62, an E-Mail message 64, or some other type of information that has been selected for redirection. If the message or signal is none of these three items, then control returns to step 56, where the redirector waits for additional messages 54 to act upon. If, however the message is one of these three types of information, then the program 12 determines, at step 68, whether the trigger flag has been set, indicating that the user wants these items redirected to the mobile device 24. If the trigger flag is set, then at step 70, the redirector 12 causes the repackaging system (E-Mail or TCP/IP) to add the outer envelope to the user data item, and at step 72 the repackaged data item is then redirected to the user's mobile data communication device 24 via LAN 14, WAN 18, wireless gateway 20 and wireless network 22. Control then returns to step 56 where the program waits for additional messages and signals to act upon.

[0051] Although not shown explicitly in FIG. 4, after step 68 the program could, if operating in the preferred list mode, determine whether the sender of a particular data item is on the preferred list, and if not, then the program would skip over steps 70 and 72 and proceed directly back to step 56. If the sender is on the preferred list, then control returns to steps 70 and 72 for repackaging and transmission of the message from the preferred list sender to the mobile device 24.

[0052] FIG. 5 sets forth the method steps carried out by the user's mobile data communication device 24 in order to interface to the redirector program 12 of the present invention. At step 80, the mobile software is started and the mobile device 24 is configured to operate with the system of the present invention, including, for example, storing the address of the user's desktop system 10A.

[0053] At step 82, the mobile device waits for messages and signals 84 to be generated or received. Assuming that the redirector software 12 operating at the user's desktop system 10A is configured to redirect upon receiving a message from the user's mobile device 24, then at step 86 the user can decide to generate a command message that will start redirection at the host system 10A. If the user does so, then at step 88 the redirection message is composed and sent to the desktop system 10A via the wireless network 22, through the wireless gateway 20, via the Internet 18 to the LAN 14, and is finally routed to the desktop machine 10A.

[0054] In this situation where the mobile device 24 is sending a message directly to the desktop system 10A,

no outer wrapper is added to the message (such as message C in FIGs. 1 and 2). In addition to the redirection signal, the mobile device 24 could transmit any number of other commands to control the operation of the host system 10A, and in particular the redirector program 12. For example, the mobile 24 could transmit a command to put the host system 10A into the preferred list mode state, and then could transmit additional commands to add or subtract certain senders or certain message characteristics from the preferred list. In this manner, the mobile device 24 can dynamically limit the amount of information being redirected to it by altering the preferred list.

[0055] Other example commands include: (1) a message to change the configuration of the host system 10A to enable the mobile device 24 to receive and process certain attachments; and (2) a message to instruct the host system 10A to redirect an entire data item to the mobile device 24 in the situation where only a portion of a particular data item has been previously redirected.

[0056] Turning back to FIG. 5, if the user signal or message is not a direct message to the desktop system 10A to begin redirection (or some other command), then control is passed to step 90, which determines if a message has been received. If a message is received by the mobile, and it is a message from the user's desktop 10A, as determined at step 92, then at step 94 a desktop redirection flag is set "on" for this message, and control passes to step 96 where the outer envelope is removed. Following step 96, or in the situation where the message is not from the user's desktop 10A, as determined at step 92, control passes to step 98, which displays the message for the user on the mobile device's display. The mobile unit 24 then returns to step 82 and waits for additional messages or signals.

[0057] If the mobile device 24 determines that a message has not been received at step 90, then control passes to step 100, where the mobile 24 determines whether there is a message to send. If not, then the mobile unit returns to step 82 and waits for additional messages or signals. If there is at least one message to send, then at step 102 the mobile 24 determines whether it is a reply message to a message that was received by the mobile unit. If the message to send is a reply message, then at step 108, the mobile 24 determines whether the desktop redirection flag is on for this message. If the redirection flag is not on, then at step 106 the reply message is simply transmitted from the mobile device 24 to the destination address via the wireless network 22. If, however, the redirection flag is on, then at step 110 the reply message is repackaged with the outer envelope having the addressing information of the user's desktop system 10A, and the repackaged message is then transmitted to the desktop system 10A at step 106. As described above, the redirector program 12 executing at the desktop system then strips the outer envelope and routes the reply message to the appropriate destination address using the address of the desktop system 10A as the "from" field, so that to the recipient of the redirected message,

it appears as though it originated from the user's desktop system rather than the mobile data communication device.

[0058] If, at step 102, the mobile 24 determines that the message is not a reply message, but an original message, then control passes to step 104, where the mobile 24 determines if the user is using the redirector software 12 at the desktop system 10A, by checking the mobile unit's configuration. If the user is not using the redirector software 12, then the message is simply transmitted to the destination address at step 106. If, however, the mobile determines that the user is using the redirector software 12 at the desktop system 10A, then control passes to step 110, where the outer envelope is added to the message. The repackaged original message is then transmitted to the desktop system 10A at step 106, which, as described previously, strips the outer envelope and routes the message to the correct destination. Following transmission of the message at step 106, control of the mobile 24 returns to step 82 and waits for additional messages or signals.

[0059] Now with reference to FIGs. 6-8, there will be described an alternative two-host Internet-based system using many of the features of the system described in the network-based host system 10B configuration shown in FIG. 2. In the system shown in FIGs. 6-8, however, instead of a single host system 10B for storing the user's messages and for operating the redirector program 12, there are two hosts, a messaging host 230, where the user's data items are stored, and a wireless redirector host system 240, where a wireless redirector program 242 operates. These two host system are preferably coupled together via the Internet 218. The wireless redirector program 242 is similar in many respects to the redirector program 12 described above, but is configured for communicating with a wireless gateway 260 coupled to a wireless data network 222.

[0060] With reference to FIG. 6, there is shown an example system diagram showing the redirection of user data items, such as message A, from user A's desktop PC 204 to user B's mobile data communication device 220, or alternatively, message B from user B's mobile communication device 220 to user A. In this example, the messaging host system 230 maintains and stores data items received from the Internet 218 for user B in a message inbox. In this particular system example, the messaging host system 230 is preferably an Internet Service Provider ("ISP") that provides connectivity to the Internet 218 for a plurality of users, including user B. In another embodiment of the present invention, the messaging host 230 may be a web-based E-mail hosting service such as MSN Hotmail™ or a variety of other known web-based E-mail hosting systems. In another embodiment of the invention, the E-mail hosting service supplies a strictly wireless solution.

[0061] In this embodiment of the invention, the messaging host system 230 is configured so as to forward a copy of all incoming data items destined for user B's inbox

to a second host referred to herein as a wireless redirector host system 240. The wireless redirector host system 240 includes the wireless redirector program 242. Advantageously, data items destined for a user of the messaging host system 230 having a mobile communication device are continuously "pushed" to the wireless redirector host system 240 as they arrive at the messaging host system 230. Upon arrival at the redirector host system 240, a wireless redirector software program 242 operating at the system 240 determines whether such data items are user-selected data items to be pushed via a wireless network 222 to the user's mobile communications device 220. In this manner, user-selected data items are advantageously pushed out to the mobile communication device 220 contemporaneously as they arrive to the messaging host system 230 so that the user need not be concerned about delays in receiving user-selected data items on the user's mobile communication device 220.

[0062] The wireless redirector host system 240 acts primarily as a gateway for data items received from the Internet 218 and those specific data items that have been user pre-selected to be redirected (via filtering rules to be described later) to the user's mobile communications device via the wireless network 222. These filtering rules are similar to the "preferred list mode" operation described above with respect to the systems shown in FIGS. 1 and 2.

[0063] Message A in FIG. 6 represents a data item, such as an E-mail message, sent from user A's desktop PC 204 having user B as the recipient. Because user B has a mailbox on the messaging host system 230, the message A will be directed via the Internet to the host system 230. The flow of this message A is shown in a single solid line 206.

[0064] Message B in FIG. 6 represents an external message created on and sent from user B's mobile data communications device 220 having user A as a recipient. Alternatively, message B also may represent a command message from user B's mobile data communication device 220 to the wireless redirector host system 240. The flow of this message B is shown in a single dashed line 258.

[0065] As described in more detail in FIG. 7, the wireless redirector host system 240 preferably includes, along with the typical hardware and software associated with an Internet gateway, the wireless redirector software 242 which includes a mail handler, preferably a sendmail daemon (not shown), a local delivery agent (not shown), a plurality of wireless mail stores 248 (preferably one for each mobile user such as user B), a filter database 250, and a mobile user profile database 254.

[0066] Also as described in more detail in FIG. 7, the messaging host system 230 is preferably a Unix system that includes a sendmail daemon 232, a ".forward" file 238, and a memory storage area 236 for storing the data items of certain user's that are having messages redirected to their mobile data communication devices 220.

[0067] Referring now to FIGS. 6 and 7, the two-host system invention will first be described by way of example with reference to message A. FIG. 6 shows an E-mail message A being communicated over the Internet 218 from user A's desktop PC 204 destined for user B's inbox, which is located on the messaging host system 230. Once the message A reaches a mail handler 252 at the messaging host 230, such as a sendmail daemon 232 in the preferred embodiment, it can be detected and acted upon by this system 230.

[0068] One of the objectives of the present invention is to be as non-obtrusive as possible to the messaging host system 230 so as to make the invention simple to install and implement for ISPs. The messaging host system 230 may be configured in many ways to detect such messages. Since not all users of the ISP will have a mobile communication device 220, it is preferable that the system 230 includes a unique user file that is accessed and modified upon the arrival of any new message. The preferred method of detecting new messages, such as message A, is using Unix's ".forward" file 238. Preferably, the redirection (or forwarding) of data items is accomplished by modifying the ".forward" file 238 typically found in the user's root directory at the messaging host system 230, such as an ISP. The ".forward" file is a simple ASCII text file comprising at least a list of one or more E-mail addresses (with some control information). The sendmail daemon 232 checks for the existence of this file 238, and uses its content to forward data items to the appropriate locations. Other methods of detecting and forwarding new data items destined for a user having a mobile communications device 220 could also be used.

[0069] An example of the content of the ".forward" file modified for the present invention is:

```
\bgilhuly@isp.net bgilhuly@wirelessredirectorhost.net
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In this example, the sendmail daemon 232 would redirect a copy of any incoming data items to those two addresses, namely "bgilhuly@isp.net" and "bgilhuly@wirelessredirectorhost.net." In the latter case, the data item would, preferably, be sent via the Internet to the wireless redirector host system 240 for further handling by the wireless redirector software program 242. The former address requires the sendmail daemon 232 to send the data item to user B's inbox of the local data item store 236. User B may access his data items in the inbox as he traditionally does - by, for example, POP3 or IMAP. In this manner, the forwarding activity is transparent to the user. The user B when viewing the inbox data items at his desktop PC 202 would know of the redirecting activity only by the message text that may be added to the messages as they are redirected by the mail handler.

[0070] Assuming that the redirector program 242 is activated at the wireless redirector host system 240, and has been configured by the user to replicate certain user data items (such as message A) to the mobile communications device 220, when the message A is received at the wireless redirector host system 240, the redirector program 242 detects message A's presence and pre-

prepares the message for a second redirection to the mobile device 220. In preparing the message for the second redirection, the redirector program 242 may compress the original message A, it may compress the message header, or it may encrypt the entire message A to create a secure link to the mobile device 220. However, before the redirector program 242 compresses or encrypts the message A and redirects it to the mobile device 220, it examines stored user information and filtering rules that are associated with the recipient, user B, so as to determine how the message A should be handled.

A) Filtering

[0071] Preferably, before the redirector program 242 begins preparing the message A for redirection, the redirector 242 examines the data item with respect to rules contained on a user B configurable filtering agent 250 (see, FIG. 7) which essentially is a database of rules that are to be applied for each user's incoming data items. The filtering agent 250 is preferably accessible by the user via the World Wide Web in a filter web page 252. The filter web page 252 allows the user, if the user so desires, to access and apply a plurality of filtering rules or any combination thereof that are to be applied to all incoming data items destined for that user. Preferably, in addition to filtering rules, web page 252 allows user B to switch between an active or a de-active state for the redirection of user B's incoming messages. This switching feature is particularly useful during instances where user B is at his desktop PC 202 and accessing his inbox of the local store 236 and desires that the redirection of incoming mail to his mobile device 220 is temporarily deactivated. The following criteria are exemplary of the types of filtering rules that may be available to the user: sender(s); how addressed (To, CC, BCC); subject keyword(s); message keyword(s); and importance (high, low, normal).

[0072] In any event, the filtering agent 250 is preferably hosted by the wireless redirector host system 240, but may be hosted by alternative host systems, including the messaging host system 230 so long as the redirector program 242 has access to the most current set of rules and can make a determination whether any particular data item has satisfied all user-defined filtering rules. Alternatively implemented, the filtering agent 250 may be combined with the user profile database 254. Data items that do not clear the filtering rules are marked as "handled" by the redirector program 242 in the wireless data item store 248, and are not further handled by the redirector 242.

B) User Profile

[0073] Also accessible by the redirector program 242 is the address of the user's mobile data communication device 220, the user's SMTP address, the type of device 220, and whether the device 220 can accept certain types

of attachments, such as word processing or voice attachments. This information is preferably maintained in a user profile database 254 (see, FIG. 7). Such user information may be preferably created, updated and removed via a web-based user administration page 256. Web page 256 is preferably access-restricted to the system administrator of the messaging host system 230 who may from time to time add new users to the redirection service. In addition to the above user information, the system administrator preferably has a switch control feature on the web page 256 to deactivate or activate redirection of the data items from the host system 230 that takes precedence over the user's selection on web page 252. This, advantageously, allows the system administrator to maintain control over the value-added service described herein.

[0074] If the user's type of mobile device 220 cannot accept certain types of attachments, then the redirector program 242 can be programmed to route the attachments to a fax or voice number where the user is located. The user may provide such information details to the redirector program 242 via a return message.

C) Redirection

[0075] After the redirector program 242 has determined that a particular message should be redirected, and it has prepared the message for redirection, the software 242 preferably converts the message from MIME to CMIME (MIME is a standard Internet mail format, and CMIME is a compressed version of MIME), and then sends the message A to a memory store located in the mobile communications device 220 via the wireless gateway 250 and the wireless data network 222. In doing so, the redirector program 242 preferably packages message A as a message with an outer envelope A' that contains the addressing information of the mobile device 220. In the preferred embodiment, the outer envelope is GME. The wireless gateway 260 requires this outer envelope information A' in order to know where to send the redirected message A. Once the repackaged message (message A in A') is received by the mobile device 220, the outer envelope A' is removed, and the original message A is placed in the second memory store within the mobile device 220. By removing the outer envelope A' and presenting to the user of mobile device 220 message A, the present invention causes the mobile device 220 to appear to be at the same physical location as the messaging host system 230, or PC 202 in a transparent, seamlessly integrated Internet account hosted by messaging host system 230.

D) Outgoing Data Item From Mobile

[0076] If the redirected user data item is an E-mail message, as described above, then the user at the mobile device 220 sees the original subject line, sender's address, destination address, and carbon copy address. Preferably and desirably, the redirection of the E-mail

message A is transparent to the mobile communication device user. When the user, at the mobile device 220, replies to message A, or when the user authors a new message (a reply or a new message collectively referred to as "message B"), the software operating at the mobile device 220 adds a similar outer envelope (message B') to the reply message B (or the new message B) to cause message B to be routed to the wireless redirector host system 240 via the wireless network 222, which then removes the outer envelope B', repackages message B as message B'', and redirects message B'' to the final destination, such as user A's PC desktop 204.

[0077] The general flow of such transmission is shown as a dotted line in FIG. 6. In this embodiment of the invention, the removal of the outer envelope B' and repackaging of message B into envelope B'' results in the outgoing redirected message B'' from the wireless redirector host system 240 being sent using the E-mail address of the user's mailbox on messaging host system 230, rather than the address of the mobile device 220, so that it appears to the recipient of the message B'' that the message originated from the user's desktop system 202 or from the messaging host system 230 itself (as would be the case of a web-based E-mail hosting system) rather than the mobile data communication device 220. This is accomplished by the redirector modifying the "from" and "reply to" identifiers associated with the message B to now have the SMTP address of user B's messaging host system 230 E-mail account. Advantageously, any replies to the message B'' will then be sent to user B's inbox on messaging host system 230, which, if it is still in redirector mode, will repackage the reply and resend it to user B's mobile data device 220, as described above.

[0078] In this embodiment, a copy of message B (labelled B'') is redirected to user B's inbox at messaging host system 230 for retrieval and access by user B at some later time - for recording keeping purposes. In doing so, the redirector program 242 preferably repackages message B as message B'' so as to now have modified addressing information. In this preferred instance, the modified addressing information would include changing the "from" header information to read something to the following effect: "Sent from mobile communications device to recipient" where 'recipient' would be the recipient's address of message B''. This message B'' is forwarded, preferably via the Internet 218, to the messaging host system 230.

[0079] As shown in FIG. 7, the messaging host system is preferably configured as an ISP. Here, the ISP system 230 includes a sendmail daemon 232, which forwards the copy B'' to the local data item store 236 by a local delivery agent (not shown). Further, user B may preferably configure his local inbox of data items at the desktop 202 to store such copy messages in a specific inbox for mobile data communications device data items. Of course in the illustrative example of messaging host system 230 configured to redirect all incoming data items to

wireless redirector host system 240, sendmail 232 would detect a new message and the ".forward" file 238 would again be accessed and the forwarding information therein acted upon. Consequently, message B'' is redirected (not shown) to redirector host system 240. At the redirector host system 40, the redirector is preferably programmed to detect that such a message B'' is a redirection of message B'' sent therefrom. As such, the redirector ignores this re-redirection message. Alternatively, the mail handler 232 at the messaging host system 230 is configured to detect such messages and to not redirect such messages.

[0080] It is to be understood that a plurality of messaging host systems 230 may use a single redirector host system 240 for redirection of users' E-mail messages. Further still, a single redirector program 242 may be used to service the plurality of messaging host systems 230.

[0081] Finally, turning to FIG. 8, a flow chart is set forth showing the steps carried out by the redirector program 242 operating at the redirector host system 240 shown in FIGs. 6 and 7. The basic steps carried out by the mobile communications device 220 in order to interface with the redirector host system 240 may be accomplished by substantially the same steps as shown in FIG. 5, although modified for this two-host aspect of the invention.

[0082] The flow chart in FIG. 8 assumes that the redirector program 242 has been activated and is operating. Additional configuration steps will be necessary to enable redirection services for a new messaging host system 230. These additional configuration steps include: (1) setting up a profile for the new messaging host system 230 indicating its address, etc. (2) setting up individual user profiles, (3) initiating default filtering rules for incoming messages from the messaging host system for the users, and (4) making available both the filtering rule 252 and user profile 256 web pages. The flow chart also assumes the necessary steps have been undertaken to configure the messaging host system 230 to forward a copy of all incoming messages to the redirector host system 240 (i.e., the Unix ".forward" file has been properly configured.)

[0083] Once the messaging host system 230 is configured 268 and the redirector program 242 is configured 270, the program 242 then waits for data items at step 272. As discussed earlier, data items need not be limited to E-mail messages but may also include signals that are representative of user profile changes or filtering rule changes.

[0084] When a data item is detected, the program determines at steps 274, 276 and 278 whether the data item is, respectively, a user profile change 274, a message from the Internet 276, or a message from the wireless mobile device 278. If the data item is a user profile change, then the appropriate user profile change is made at 280. Control then returns to step 272 where the program waits for additional data items. If the data item is a message from the Internet, then the appropriate user profile information is checked and applied at step 290. The

program then checks if the filter rules have changed at step 292. If so, the filter rules are reloaded. Next, the filter rules are applied at step 296. If the message does not clear all applicable redirection filter rules at step 297, the preparation and redirection steps 298 and 300, respectively, are skipped. The message is thus ignored and control is returned to the redirector program 242 at step 272. Assuming, however, that the message (or at least a portion thereof) is to be redirected, then the message is prepared for redirection at step 298. In the preparation step 298, the redirector program 242 adds the outer envelope to the message for wireless transmission. At step 300, the repackaged message is then forwarded to the user's mobile device 220 via LAN 258, wireless gateway 260 and wireless network 222. Control then returns to step 272 where the program waits for additional data items to act upon.

[0085] If, at step 278, there is a determination that the data item is a message from the mobile device 220, then the message is prepared for Internet redirection at step 284. Preparation would preferably include changing the "from" and "reply to" fields of the message to replicate the address of the user's SMTP address at the messaging host system 230 - the resulting message referred to as message B" in FIG. 6. Also, the preparation step may include making a second copy of the message, such message referred to as message B'" in FIG. 6. In this second copy, the "from" field is changed to, preferably, "Sent from the mobile device to Recipient" where 'Recipient' is the SMTP address of the recipient of message B". At step 286, previous messages or attachments are appended. At step 288, one message is forwarded to the recipient (message B") and the copy of the message (message B'"') is forwarded to the user's messaging host system 230 destined for the user's local data item store 236 for record keeping purposes. Control then returns to step 272, where the program waits for additional data items to act upon. If, at step 278, there is a determination that the data item is not a message from the wireless device, other functions may be performed by the redirector program 242 if so programmed to do so. For instance, the message could be a command message such as described earlier in this application where additional text of the E-mail message may be transmitted to the mobile device 220.

[0086] Although not explicitly shown in the flowchart, if at step 276 there is a determination that the message is from the Internet, then the redirector program 242 would check whether the message is a re-redirection message from the messaging host system 230. If so, all subsequent steps are skipped (the message is ignored) and control is returned to step 272. In this manner, re-redirection messages are not redirected to the mobile device 220. Alternatively implemented, this determination could be undertaken at step 296 as part of the default filtering rules. It is to be understood that the user profile and filtering rules could alternatively be combined together, thus eliminating a step(s). This is, of course, well within

the scope of the present invention.

[0087] Although not shown, the additional step of maintaining the wireless data item store 248 is another step(s) that the redirector would preferably manage. At a predetermined storage threshold either by date or size, each user's earliest stored data item would be deleted to make room for newer incoming data items.

[0088] Referring now to FIG. 9-12, there will be described an alternative multi-host Internet-based system using many of the features of the system described in the two-host Internet-based system configuration shown in FIG. 6-8. In the redirector system 200 shown in FIGS. 9-12, instead of a two-host system for storing the mobile device user's messages and for operating the redirector program 12, there is a multiplicity of hosts, with each one performing part of the distributed tasks of redirector program 12. The redirector system 200 is capable of handling a multiplicity of messaging hosts 230, where the mobile device user's data items are stored. Each messaging host 230 corresponds to an ISP with its own set of users, a subset of which are configured to have their email forwarded for wireless redirection to their respective mobile devices 220 via the mail handler 232 according to the forward file 238, as described above with reference to FIGS. 6-8. However, in the multi-host Internet-based system 200, instead of using a single wireless redirector host system 240, and a single wireless redirector program 242, the redirector program has been embodied into a multiplicity of redirector send agents 245 and a redirector receive agents 249, each pair of which can be hosted on separate redirector agent host servers 243. This multi-host configuration provides the significant advantage of allowing the redirector system 200 to be scalable and easily configured to support multiple ISPs each having multiple sites, with each site having an associated Internet domain name. A single redirector agent host server can support several send and receive pairs of redirector agents, and each pair of agents serving multiple ISP sites. The mapping of redirector host servers to ISP sites and the configuration of redirector agents is accomplished via the web-based administration 257 of the administration information database 259.

[0089] SMTP is the only system interface the ISP needs to support in order to interface with redirector system 200 during normal operation. Advantageously, a web browser is the only user interface 253 an ISP needs to support in order to configure the redirector system 200. Similarly, a web browser is the user interface 256 a user needs to support in order to configure the redirector system 200.

[0090] By using a hierarchy of stored configuration information in the databases 259, 255, 254 and 250, the web interfaces 257, 256, 253 and 252 allow a plurality of system 200 administrative accounts to manage a plurality of site manager accounts, which in turn manage a plurality of site dependent mobile device user accounts. At each level down, the web-based interfaces provide access to only those elements of the databases for which

the account has authority.

[0091] Administrative accounts have authority to manage site manager accounts, redirector agent host server configuration records, and set site configuration default values. Site manager accounts have authority to override certain site configuration records, manage user accounts, and set user configuration default values. User accounts have authority to override certain user records. The next three paragraphs illustrate the type of information and authority associated with the three accounts described above.

[0092] The access to administrative operations is limited to system 200 operators who have an administrative account comprising an administrator name and password useable on web-based administration page 257 in order to gain access to the administration database 259. An administrator of system 200 manages records for configuring redirector agent host servers, and manages accounts for site managers, which access the site information database 255 via web-based site information page 253.

[0093] Site managers represent ISP hosted Internet domains and manage site information records for further configuring redirector agents, and manage accounts for mobile device 220 users who wish to use system 200 for redirecting their data items. The site information record includes such items as, for example, an optional Internet domain name and a default tag line to be appended at the end of every email.

[0094] A site mobile user, when provided with an account by a site manager, can access the user information database 254 via web based user administration page 256, in order to update those fields of their user information record for which they have authority. For instance, a user might wish to override the default site wide tag line stored in the site info record corresponding to his site, thereby enabling the the tag-line customization feature. The user might also wish to override the default domain name based email address provided by his site manager by specifying his single SMTP address, thereby enabling domain-messaging feature.

[0095] As used in this description and in the appended claims, the phrase domain-messaging is defined as the feature which allows an ISP or a site manager to customize the "sent from" and "reply to" addresses for messages generated at a mobile device by a mobile device user. This new feature functionality allows an ISP to effectively offer "single email address" functionality to their mobile device users that have an email address, which is different from the ISP's default domain address. For example, a first mobile device user with "single email address" user@userscompany.com, can go through ISP's forwarding service over domain isp.com where the user has traditionally the email address user@isp.com. In one embodiment of the present invention, the ISP can activate the domain-messaging feature of the redirector receive agent to replace user@isp.com with user@user-company.com in the "sent from" and "reply to" fields for

email messages generated (i.e., originally created, or replied from) at the mobile device user's mobile device, thereby (1) allowing the user to advantageously use only one email address when creating messages at either his mobile device or at his traditional non-wireless email generation means and (2) making it appear as though the user has a "single email address", user@user company.com.

[0096] Closely related to the domain-messaging feature is the tag line customization feature, which as used in this description and in the appended claims, is defined as the feature, which allows an ISP to provide a default tag line to be appended to all of its mobile device users' messages generated at and sent from the mobile device, as well as the user's ability to customize the tag line. Preferably, the tag line is appended to the messages after arrival from the wireless network such as at the redirector system, but prior to transmission to the intended recipient. This advantageously permits over-the-air bandwidth transmission savings. For instance, an ISP may wish to have a default tag line which reads, for instance, "This mobile message brought to you by <http://www.isp.com/>" thereby creating a sales opportunity at every email message sent by every one of their new mobile users. A mobile user can then customize the tag line by, for instance, including a signature such as:

With regards,
User Name
tel.: xxx.yyy.zzz xwww
e-mail: user@isp.com

[0097] FIG. 11 illustrates the steps taken by a redirector receive agent 249 in order to accomplish the two features described in the previous paragraphs, namely domain-messaging and tag-line customization. In this example, the redirector receive agent can be considered to accomplish steps 284, 286, and 288 of the redirector program 242 illustrated in FIG. 8, as well as the additional domain-messaging and tag line customization features to be described. At step 300, the redirector receive agent is notified that a wireless message is available for redirection in wireless data item store 248. This step consists of getting the message data 310 comprised of a content type, a stream, and a user id. This example assumes that the message type is an email message originated from the user's mobile device 220. At the next step 320, the user id 312 obtained in step 300 is used as a key to obtain a user record 330 from the user information database 254. At step 340, site id 332 obtained in step 320 is used as a key to obtain site information record 350 from the site information database 255. Step 400, comprised of steps 410, 420, 430 and 440, sets the user's email address upon the condition of the site information record 350 having a blank domain name. If the domain name is blank, the SMTP address found in the user record 330 is used as the email address. If a domain name is found in site record 350, a juxtaposition of user name and do-

main name is utilized as the email address. Step 440 replaces the "send from/ reply to" addresses of the message to the email address. Collectively, step 400 accomplishes the domain-messaging feature. Steps 500, comprised of steps 510, 520, 530 and 540 collectively accomplish the tag-line customization. In step 510, the user tag line found in user record 330 is examined. If the user tag line is blank, the site tag line found in record 350 is utilized. If the user tag line is not blank, it is utilized instead of the site tag line. The utilized tag line is appended to the message at step 540. Finally, step 288 proceeds to send the message to the recipient designated in the message via the Internet, as described in reference to FIG. 8.

[0098] Although not explicitly shown in the drawings, it is considered a variation of the present invention that is within the scope of the invention to perform other types of automated information substitution in message data items of which two examples have been illustrated in the case of domain-messaging and tag line customization in the redirector receive agent.

[0099] As illustrated in Fig. 12, the system 200 advantageously permits at least one ISP, such as ISP A 600, to provide wireless redirection for its customer base and customized single email address transparency for a plurality of companies, such as Company A and Company B, by managing a distinct site for each company, in this case ISP A site 610, Company A site 612, and Company B site 614, with corresponding site manager accounts on the redirector system 200. Mobile device users associated to each of those sites can configure their email tag lines, and their email address obtained by juxtaposing their email name and their custom site's domain name, by taking advantage of domain-messaging and tag line customization respectively, via the web-based user interface 256.

[0100] Continuing with the same example, if ISP A having a corresponding messaging host 230 wishes to offer wireless redirection to its base users, the web-based site admin page 257 is used to create a site manager account for the ISP by the system 200 administrator in the administration information database 259 via the user interface 257. The 257 interface is also be used to create site manager accounts for other sites managed by the ISP, such as Company A or Company B. The web-based administration page 257 is also used to configure the name and authentication information of the redirector agent host server 243, and associated redirector send and receive agents corresponding to each site. Then the ISP need only: a) provide configuration site information to the site info database 255 via the web based site information page 253, said site information corresponding to ISP site infrastructure such as the IP address of the mail handler 232, associated site domain name, and the creation of individual mobile device user accounts for its mobile device users; and b) add an entry for each of its mobile device users in the forward file 238. After the ISP mobile device user accounts 616, 616', 616" are created for each site, the ISP mobile device users can update their

respective user information 254 using the web-based user admin page 256.

[0101] ISP A provides wireless redirection service of messages traditionally only hosted at and accessed via the ISP to mobile devices assigned to its traditional ISP customer base. Some of the ISP customers base comprise of customers with customized domain names (i.e., domain.com) wherein the ISP hosts a web site (i.e., www.domain.com) and a plurality of email addresses associated with the customized domain names (i.e., john@domain.com). Such customers who opt for the wireless redirection of their email messages advantageously by virtue of the present invention may continue to use their customized email addresses when generating and receiving email messages at their mobile device.

Claims

1. A method of redirecting data messages from a messaging host system (230) to a wireless mobile communication device (220), comprising the steps of:

- transmitting a data message to the messaging host system (230), wherein the messaging host system (230) stores the data message in a first message store (236) associated with a user of the wireless mobile communication device (220);
- detecting the data message at the messaging host system (230);
- forwarding a copy of the data message from the messaging host system (230) to a wireless redirector host system (240) via a wide area network connection between the messaging host system (230) and the wireless redirector host system (240);
- storing the data message in a second message store (248) associated with the user of the wireless mobile communication device (220) at the wireless redirector host system (240);
- determining whether the data message stored in the second message store (248) should be redirected from the wireless redirector host system (240) to the user's wireless mobile communication device (220); and
- if the data message should be redirected, then packaging the data message into an electronic envelope (A') and transmitting the electronic envelope (A') from the wireless redirector host system (240) to the user's wireless mobile communication device (220) via a wireless gateway (260) coupling the wireless redirector host system (240) to a wireless transmission network.

2. The method of claim 1, wherein the data message is an e-mail message and the first data store (236) is an e-mail inbox associated with an electronic mail

system.

3. The method according to one of the claims 1 or 2, wherein the detecting step includes the steps of:

- determining whether a data message has been received at the messaging host system (230) for a particular user of a wireless mobile communication device; and
- checking a forwarding file (238) coupled to the messaging host system (230) to determine whether the particular user's data messages should be forwarded to the wireless redirector host system (240).

4. The method of claim 3, wherein the forwarding file (238) includes a list of network addresses associated with the wide area network connection where the user's data messages should be forwarded by the messaging host system (230).

5. The method according to one of the claims 1 to 4, further comprising the steps of:

- configuring a set of filtering rules (250) for use by the wireless redirector host system (240) in determining whether the data message should be redirected to the user's wireless mobile communication device (220); and
- providing an access mechanism that allows the user to remotely configure and reconfigure the filtering rules (250) by connecting to the wireless redirector host system (240) from a remote terminal.

6. The method of claim 5, wherein the access mechanism for remotely configuring and reconfiguring the filtering rules is a web-page interface.

7. The method according to one of the claims 1 to 6, further comprising the steps of:

- configuring a user profile database (254) for use by the wireless redirector host system (240) in determining whether the data message should be redirected to the user's wireless mobile communication device (220); and
- providing an access mechanism (256) that allows a system administrator of the messaging host system (230) to remotely configure and reconfigure the user profile database (254) by connecting to the wireless redirector host system (240) from a remote terminal.

8. The method of claim 7, wherein the access mechanism for remotely configuring and reconfiguring the user profile database (254) is a web-page interface.

9. The method according to one of the claims 1 to 8, further comprising the steps of:

- receiving the electronic envelope (A') at the user's wireless mobile communication device (220);
- extracting the data message from the electronic envelope (A'); and
- storing the data message within a memory of the mobile device.

10. The method according to one of the claims 1 to 9, further comprising the steps of:

- generating a reply data message at the wireless mobile communication device (220);
- packaging the reply data message into an electronic envelope and transmitting the electronic envelope to the wireless redirector host system (240).

11. The method of claim 10, wherein the electronic envelope is addressed using an electronic address of the wireless redirector host system (240).

12. The method of claim 11, further comprising the steps of:

- extracting the reply data message from the electronic envelope at the wireless redirector host system (240);
- reconfiguring the addressing information associated with the reply data message; and
- transmitting the reconfigured reply data message from the wireless redirector host system (240) to the messaging host system (230).

13. The method of claim 12, further comprising the steps of:

- receiving the reconfigured reply data message at the messaging host system (230); and
- storing the reply data message in the first message store (236) associated with the user of the wireless mobile communication device.

14. The method according to one of the claims 11 to 13, further comprising the steps of:

- extracting the reply data message from the electronic envelope at the wireless redirector host system (240);
- reconfiguring the addressing information associated with the reply data message; and
- transmitting the reconfigured reply data message to a destination system using an electronic address included in the reply data message.

15. The method according to one of the claims 1 to 14, further comprising the step of:

- transmitting a deactivation message associated with the user of the wireless mobile communication device to the wireless redirector host system; and
- upon receiving the deactivation message, prohibiting the redirection of data messages for the user sending the deactivation message.

16. The method according to one of the claims 1 to 15, wherein the determining step includes the steps of:

- accessing a user profile database (254) including a list of authorized users; and
- checking whether the user associated with the data message is an authorized user to determine whether the data message should be redirected to the user's wireless mobile communication device (220).

17. The method according to one of the claims 1 to 16, wherein the determining step includes the steps of:

- accessing a filter rules database (250) including a list of filters to be applied to data messages for a particular user; and
- applying the filters to the data message to determine whether the data message should be redirected to the user's wireless mobile communication device (220).

18. The method according to one of the claims 1 to 17, wherein the packaging step includes the step of addressing the electronic envelope using the electronic address of the user's wireless mobile communication device (220).

19. The method according to one of the claims 1 to 18, wherein the user's wireless mobile communication device (220) is a laptop computer.

20. The method according to one of the claims 1 to 18, wherein the user's wireless mobile communication device (220) is a two-way paging computer.

21. The method of claim 20, wherein the two-way paging computer includes a wireless network interface for communicating with the wireless redirector host system (240) via the wireless transmission network.

22. The method of claim 21, wherein the electronic envelope is addressed using the wireless transmission network address of the two-way paging computer.

23. The method according to one of the claims 1 to 22, wherein the messaging host system (230) is an In-

ternet Service Provider.

24. The method of claim 23, wherein the data items are E-mail messages, and the Internet Service Provider includes a mail server program.

25. The method of claim 24, wherein the Internet Service Provider further includes a forwarding database coupled to the mail server program for detecting whether a data message received at the mail server should be forwarded to a wireless redirector host system (240), and for determining the electronic network address of the wireless redirector host system (240).

26. The method according to one of the claims 1 to 25, wherein the wide area network connection coupling the messaging host system (230) to the wireless redirector host system (240) is an Internet connection.

27. The method according to one of the claims 1 to 26, further comprising the steps of:

- configuring a user profile database (254) for use by the wireless redirector host system (240) in determining whether the data message should be redirected to the user's wireless mobile communication device (220); and
- storing, within the user profile database (254), the electronic address of the user's wireless mobile communication device (220).

28. The method of claim 27, further comprising the steps of:

- storing, within the user profile database (254), information regarding the type and configuration of the user's wireless-mobile communication device (220).

29. The method according to one of the claims 1 to 28, wherein the packaging step further includes the steps of:

- converting the data message into a compressed format; and
- placing the compressed data message into an electronic envelope addressed using the electronic address of the user's wireless mobile communication device (220).

30. The method according to one of the claims 1 to 29, wherein the data message is a calendar event message.

Patentansprüche

1. Verfahren zum Um- bzw. Weiterleiten von Daten-

nachrichten von einem Messaging-Hostsystem (230) an eine drahtlose mobile Kommunikationsvorrichtung (220), das die Schritte aufweist:

- Übertragen einer Datennachricht an das Messaging-Hostsystem (230), wobei das Messaging-Hostsystem (230) die Datennachricht in einem ersten Nachrichtenspeicher (236) speichert, der zu einem Benutzer der drahtlosen mobilen Kommunikationsvorrichtung (220) gehört; 5
 - Erfassen der Datennachricht an dem Messaging-Hostsystem (230); 10
 - Weiterleiten einer Kopie der Datennachricht von dem Messaging-Hostsystem (230) an ein drahtloses Redirector-Hostsystem (240) über eine Weitbereichsnetzverbindung zwischen dem Messaging-Hostsystem (230) und dem drahtlosen Redirector-Hostsystem (240); 15
 - Speichern der Datennachricht in einem zweiten Nachrichtenspeicher (248), der zu dem Benutzer der drahtlosen mobilen Kommunikationsvorrichtung (220) gehört, an dem drahtlosen Redirector-Hostsystem (240); 20
 - Bestimmen, ob die in dem zweiten Nachrichtenspeicher (248) gespeicherte Datennachricht von dem drahtlosen Redirector-Hostsystem (240) an die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers um- bzw. weitergeleitet werden soll; und 25
 - wenn die Datennachricht um- bzw. weitergeleitet werden soll, dann Verpacken der Datennachricht in einen elektronischen Umschlag (A') und Übertragen des elektronischen Umschlags (A') von dem drahtlosen Redirector-Hostsystem (240) an die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers über ein drahtloses Gateway (260), das das drahtlose Redirector-Hostsystem (240) mit einem drahtlosen Übertragungsnetzwerk verbindet. 30
2. Verfahren gemäß Anspruch 1, wobei die Datennachricht eine E-Mail-Nachricht ist und der erste Datenspeicher (236) eine E-Mail-Inbox ist, die zu einem elektronischen Mail-System gehört. 35
3. Verfahren gemäß einem der Ansprüche 1 oder 2, wobei der Erfassungsschritt die Schritte umfasst: 40
- Bestimmen, ob eine Datennachricht an dem Messaging-Hostsystem (230) für einen bestimmten Benutzer einer drahtlosen mobilen Kommunikationsvorrichtung empfangen wurde; 45
 - Überprüfen einer Weiterleitungsdatei (238), die mit dem Messaging-Hostsystem (230) verbunden ist, um zu bestimmen, ob die Datennachrichten des bestimmten Benutzers an das drahtlose Redirector-Hostsystem (240) weitergeleitet werden sollen. 50
- 55

4. Verfahren gemäß Anspruch 3, wobei die Weiterleitungsdatei (238) eine Liste von Netzwerkadressen umfasst, die zu der Weitbereichsnetzverbindung gehören, auf der die Datennachrichten des Benutzers von dem Messaging-Hostsystem (230) weitergeleitet werden sollen.

5. Verfahren gemäß einem der Ansprüche 1 bis 4, das weiter die Schritte aufweist:

- Konfigurieren eines Satzes von Filterregeln (250) zur Verwendung durch das drahtlose Redirector-Hostsystem (240) bei der Bestimmung, ob die Datennachricht an die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers um- bzw. weitergeleitet werden soll; und
- Vorsehen eines Zugriffsmechanismus, der dem Benutzer ermöglicht, die Filterregeln (250) aus der Entfernung durch Verbinden mit dem drahtlosen Redirector-Hostsystem (240) von einem entfernten Endgerät zu konfigurieren und neu zu konfigurieren.

6. Verfahren gemäß Anspruch 5, wobei der Zugriffsmechanismus zum Konfigurieren und neu Konfigurieren der Filterregeln aus der Entfernung eine Webseiten-Schnittstelle ist.

7. Verfahren gemäß einem der Ansprüche 1 bis 6, das weiter die Schritte aufweist:

- Konfigurieren einer Benutzerprofil-Datenbank (254) zur Verwendung durch das drahtlose Redirector-Hostsystem (240) bei der Bestimmung, ob die Datennachricht an die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers um- bzw. weitergeleitet werden soll; und
- Vorsehen eines Zugriffsmechanismus (256), der einem Systemadministrator des Messaging-Hostsystems (230) ermöglicht, die Benutzerprofil-Datenbank (254) aus der Entfernung durch Verbinden mit dem drahtlosen Redirector-Hostsystem (240) von einem entfernten Endgerät zu konfigurieren und neu zu konfigurieren. 50

8. Verfahren gemäß Anspruch 7, wobei der Zugriffsmechanismus für ein Konfigurieren und neu Konfigurieren der Benutzerprofil-Datenbank (254) aus der Entfernung eine Webseiten-Schnittstelle ist.

9. Verfahren gemäß einem der Ansprüche 1 bis 8, das weiter die Schritte aufweist:

- Empfangen des elektronischen Umschlags (A') an der drahtlosen mobilen Kommunikationsvorrichtung (220) des Benutzers;
- Extrahieren der Datennachricht aus dem elektronischen Umschlag (A'); und

- Speichern der Datennachricht in einem Speicher der mobilen Vorrichtung.
10. Verfahren gemäß einem der Ansprüche 1 bis 9, das weiter die Schritte aufweist: 5
- Erzeugen einer Antwortdatennachricht an der drahtlosen mobilen Kommunikationsvorrichtung (220);
 - Verpacken der Antwortdatennachricht in einen elektronischen Umschlag und Übertragen des elektronischen Umschlags an das drahtlose Redirector-Hostsystem (240). 10
11. Verfahren gemäß Anspruch 10, wobei der elektronische Umschlag unter Verwendung einer elektronischen Adresse des drahtlosen Redirector-Hostsystems (240) adressiert wird. 15
12. Verfahren gemäß Anspruch 11, das weiter die Schritte aufweist: 20
- Extrahieren der Antwortdatennachricht aus dem elektronischen Umschlag an dem drahtlosen Redirector-Hostsystem (240);
 - Neukonfigurieren der Adressierungsinformation, die zu der Antwortdatennachricht gehört; und
 - Übertragen der neu konfigurierten Antwortdatennachricht von dem drahtlosen Redirector-Hostsystem (240) an das Messaging-Hostsystem (230). 25 30
13. Verfahren gemäß Anspruch 12, das weiter die Schritte aufweist: 35
- Empfangen der neu konfigurierten Antwortdatennachricht an dem Messaging-Hostsystem (230); und
 - Speichern der Antwortdatennachricht in dem ersten Nachrichtenspeicher (236), der zu dem Benutzer der drahtlosen mobilen Kommunikationsvorrichtung gehört. 40
14. Verfahren gemäß einem der Ansprüche 11 bis 13, das weiter die Schritte aufweist: 45
- Extrahieren der Antwortdatennachricht aus dem elektronischen Umschlag an dem drahtlosen Redirector-Hostsystem (240);
 - Neukonfigurieren der Adressierungsinformation, die zu der Antwortdatennachricht gehört; und
 - Übertragen der neu konfigurierten Antwortdatennachricht an ein Zielsystem unter Verwendung einer in der Antwortdatennachricht enthaltenen elektronischen Adresse. 50
15. Verfahren gemäß einem der Ansprüche 1 bis 14, das weiter die Schritte aufweist:
- Übertragen einer Deaktivierungsnachricht, die zu dem Benutzer der drahtlosen mobilen Kommunikationsvorrichtung gehört, an das drahtlose Redirector-Hostsystem; und
 - bei Empfang der Deaktivierungsnachricht, Verhindern der Um- bzw. Weiterleitung von Datennachrichten für den Benutzer, der die Deaktivierungsnachricht sendet.
16. Verfahren gemäß einem der Ansprüche 1 bis 15, wobei der Bestimmungsschritt die Schritte aufweist:
- Zugreifen auf eine Benutzerprofil-Datenbank (254), die eine Liste von autorisierten Benutzern umfasst; und
 - Überprüfen, ob der zu der Datennachricht gehörende Benutzer ein autorisierter Benutzer ist, um zu bestimmen, ob die Datennachricht an die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers um- bzw. weitergeleitet werden soll.
17. Verfahren gemäß einem der Ansprüche 1 bis 16, wobei der Bestimmungsschritt die Schritte aufweist:
- Zugreifen auf eine Filterregeln-Datenbank (250), die eine Liste von Filtern umfasst, die auf Datennachrichten für einen bestimmten Benutzer anzuwenden sind; und
 - Anwenden der Filter auf die Datennachricht, um zu bestimmen, ob die Datennachricht an die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers um- bzw. weitergeleitet werden soll.
18. Verfahren gemäß einem der Ansprüche 1 bis 17, wobei der Verpackungsschritt den Schritt des Adressierens des elektronischen Umschlags unter Verwendung der elektronischen Adresse der drahtlosen mobilen Kommunikationsvorrichtung (220) des Benutzers umfasst.
19. Verfahren gemäß einem der Ansprüche 1 bis 18, wobei die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers ein Laptop-Computer ist.
20. Verfahren gemäß einem der Ansprüche 1 bis 18, wobei die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers ein Zweiweg-Paging-Computer ist. 55
21. Verfahren gemäß Anspruch 20, wobei der Zweiweg-Paging-Computer eine drahtlose Netzwerkschnittstelle umfasst zum Kommunizieren mit dem drahtlosen Redirector-Hostsystem (240) über das draht-

lose Übertragungsnetzwerk.

22. Verfahren gemäß Anspruch 21, wobei der elektronische Umschlag unter Verwendung der Adresse des drahtlosen Übertragungsnetzwerks des Zweig-Paging-Computers adressiert wird. 5
23. Verfahren gemäß einem der Ansprüche 1 bis 22, wobei das Messaging-Hostsystem (230) ein Internetdiensteanbieter ist. 10
24. Verfahren gemäß Anspruch 23, wobei die Datenelemente E-Mail-Nachrichten sind und der Internetdiensteanbieter ein Mail-Server-Programm umfasst.
25. Verfahren gemäß Anspruch 24, wobei der Internetdiensteanbieter weiter eine mit dem Mail-Server-Programm verbundene Weiterleitungsdatenbank umfasst, um zu erfassen, ob eine an dem Mail-Server empfangene Datennachricht an ein drahtloses Redirector-Hostsystem (240) weitergeleitet werden soll, und zur Bestimmung der elektronischen Netzwerkadresse des drahtlosen Redirector-Hostsystems (240). 20
26. Verfahren gemäß einem der Ansprüche 1 bis 25, wobei die Weitbereichsnetzverbindung, die das Messaging-Hostsystem (230) mit dem drahtlosen Redirector-Hostsystem (240) verbindet, eine Internet-Verbindung ist. 25
27. Verfahren gemäß einem der Ansprüche 1 bis 26, das weiter die Schritte aufweist: 30
- Konfigurieren einer Benutzerprofil-Datenbank (254) zur Verwendung durch das drahtlose Redirector-Hostsystem (240) bei der Bestimmung, ob die Datennachricht an die drahtlose mobile Kommunikationsvorrichtung (220) des Benutzers um- bzw. weitergeleitet werden soll; und 35
 - Speichern der elektronischen Adresse der drahtlosen mobilen Kommunikationsvorrichtung (220) des Benutzers in der Benutzerprofil-Datenbank (254). 40
28. Verfahren gemäß Anspruch 27, das weiter die Schritte aufweist: 45
- Speichern einer Information hinsichtlich des Typs und der Konfiguration der drahtlosen mobilen Kommunikationsvorrichtung (220) des Benutzers in der Benutzerprofil-Datenbank (254). 50
29. Verfahren gemäß einem der Ansprüche 1 bis 28, wobei der Verpackungsschritt weiter die Schritte aufweist: 55
- Konvertieren der Datennachricht in ein kom-

primiertes Format; und

- Platzieren der komprimierten Datennachricht in einen elektronischen Umschlag, der unter Verwendung der elektronischen Adresse der drahtlosen mobilen Kommunikationsvorrichtung (220) des Benutzers adressiert wird.

30. Verfahren gemäß einem der Ansprüche 1 bis 29, wobei die Datennachricht eine Kalenderereignisnachricht ist. 10

Revendications

1. Procédé de redirection de messages de données d'un système hôte de messagerie (230) à un dispositif de communication mobile sans fil (220), comprenant les étapes consistant à : 15
- transmettre un message de données au système hôte de messagerie (230), dans lequel le système hôte de messagerie (230) stocke le message de données dans une première mémoire de messages (236) associée à un utilisateur du dispositif de communication mobile sans fil (220) ; 20
 - détecter le message de données au niveau du système hôte de messagerie (230) ;
 - transférer une copie du message de données du système hôte de messagerie (230) à un système hôte redirecteur sans fil (240) via une connexion de réseau étendu entre le système hôte de messagerie (230) et le système hôte redirecteur sans fil (240) ; 25
 - stocker le message de données dans une seconde mémoire de messages (248) associée à l'utilisateur du dispositif de communication mobile sans fil (220) au niveau du système hôte redirecteur sans fil (240) ;
 - déterminer si le message de données stocké dans la seconde mémoire de messages (248) devrait être redirigé du système hôte redirecteur sans fil (240) au dispositif de communication mobile sans fil de l'utilisateur (220) ; et 30
 - si le message de données devrait être redirigé, envelopper alors le message de données dans une enveloppe électronique (A') et transmettre l'enveloppe électronique (A') du système hôte redirecteur sans fil (240) au dispositif de communication mobile sans fil de l'utilisateur (220) via une passerelle sans fil (260) couplant le système hôte redirecteur sans fil (240) à un réseau de transmission sans fil. 35
2. Procédé selon la revendication 1, dans lequel le message de données est un message de courrier électronique et la première mémoire de données (236) est une boîte de réception de courrier électro-

- nique associée à un système de courrier électronique.
3. Procédé selon l'une quelconque des revendications 1 ou 2, dans lequel l'étape de détection comprend les étapes consistant à :
- déterminer si un message de données a été reçu au niveau du système hôte de messagerie (230) pour un utilisateur particulier d'un dispositif de communication mobile sans fil ; et
 - vérifier un fichier de transfert (238) couplé au système hôte de messagerie (230) pour déterminer si les messages de données de l'utilisateur particulier devraient être redirigés vers le système hôte redirecteur sans fil (240).
4. Procédé selon la revendication 3, dans lequel le fichier de transfert (238) comprend une liste d'adresses réseau associées à la connexion de réseau étendu où les messages de données de l'utilisateur devraient être transférés par le système hôte de messagerie (230).
5. Procédé selon l'une quelconque des revendications 1 à 4, comprenant en outre les étapes consistant à :
- configurer un ensemble de règles de filtrage (250) pour l'utilisation par le système hôte redirecteur sans fil (240) en déterminant si le message de données devrait être redirigé vers le dispositif de communication mobile sans fil de l'utilisateur (220) ; et
 - fournir un mécanisme d'accès qui permet à l'utilisateur de configurer et de reconfigurer à distance les règles de filtrage (250) en se connectant au système hôte redirecteur sans fil (240) depuis un terminal distant.
6. Procédé selon la revendication 5, dans lequel le mécanisme d'accès pour configurer et reconfigurer à distance les règles de filtrage est une interface de page web.
7. Procédé selon l'une quelconque des revendications 1 à 6, comprenant en outre les étapes consistant à :
- configurer une base de données de profils d'utilisateur (254) pour l'utilisation par le système hôte redirecteur sans fil (240) en déterminant si le message de données devrait être redirigé vers le dispositif de communication mobile sans fil de l'utilisateur (220) ; et
 - fournir un mécanisme d'accès (256) qui permet à un administrateur système du système hôte de messagerie (230) de configurer et de reconfigurer à distance la base de données de profils d'utilisateur (254) en se connectant au système
- hôte redirecteur sans fil (240) depuis un terminal distant.
8. Procédé selon la revendication 7, dans lequel le mécanisme d'accès pour configurer et reconfigurer à distance la base de données de profils d'utilisateur (254) est une interface de page web.
9. Procédé selon l'une quelconque des revendications 1 à 8, comprenant en outre les étapes consistant à :
- recevoir l'enveloppe électronique (A') au niveau du dispositif de communication mobile sans fil de l'utilisateur (220) ;
 - extraire le message de données de l'enveloppe électronique (A') ; et
 - stocker le message de données dans une mémoire du dispositif mobile.
10. Procédé selon l'une quelconque des revendications 1 à 9, comprenant en outre les étapes consistant à :
- générer un message de données de réponse au niveau du dispositif de communication mobile sans fil (220) ;
 - envelopper le message de données de réponse dans une enveloppe électronique et transmettre l'enveloppe électronique au système hôte redirecteur sans fil (240).
11. Procédé selon la revendication 10, dans lequel l'enveloppe électronique est adressée en utilisant une adresse électronique du système hôte redirecteur sans fil (240).
12. Procédé selon la revendication 11, comprenant en outre les étapes consistant à :
- extraire le message de données de réponse de l'enveloppe électronique au niveau du système hôte redirecteur sans fil (240) ;
 - reconfigurer l'information d'adressage associée au message de données de réponse ; et
 - transmettre le message de données de réponse reconfiguré du système hôte redirecteur sans fil (240) au système hôte de messagerie (230).
13. Procédé selon la revendication 12, comprenant en outre les étapes consistant à :
- recevoir le message de données de réponse reconfiguré au niveau du système hôte de messagerie (230) ; et
 - stocker le message de données de réponse dans la première mémoire de messages (236) associée à l'utilisateur du dispositif de communication mobile sans fil.

14. Procédé selon l'une quelconque des revendications 11 à 13, comprenant en outre les étapes consistant à :
- extraire le message de données de réponse de l'enveloppe électronique au niveau du système hôte redirecteur sans fil (240) ;
 - reconfigurer l'information d'adressage associée au message de données de réponse ; et
 - transmettre le message de données de réponse reconfiguré à un système de destination en utilisant une adresse électronique incluse dans le message de données de réponse.
15. Procédé selon l'une quelconque des revendications 1 à 14, comprenant en outre les étapes consistant à :
- transmettre un message de désactivation associé à l'utilisateur du dispositif de communication mobile sans fil au système hôte redirecteur sans fil ; et
 - à la réception du message de désactivation, empêcher la redirection de messages de données pour l'utilisateur envoyant le message de désactivation.
16. Procédé selon l'une quelconque des revendications 1 à 15, dans lequel l'étape de détermination comprend les étapes consistant à :
- accéder à une base de données de profils d'utilisateur (254) incluant une liste d'utilisateurs autorisés ; et
 - vérifier si l'utilisateur associé au message de données est un utilisateur autorisé pour déterminer si le message de données devrait être redirigé vers le dispositif de communication mobile sans fil de l'utilisateur (220).
17. Procédé selon l'une quelconque des revendications 1 à 16, dans lequel l'étape de détermination comprend les étapes consistant à :
- accéder à une base de données de règles de filtre (250) incluant une liste de filtres à appliquer à des messages de données pour un utilisateur particulier ; et
 - appliquer les filtres au message de données pour déterminer si le message de données devrait être redirigé vers le dispositif de communication mobile sans fil de l'utilisateur (220).
18. Procédé selon l'une quelconque des revendications 1 à 17, dans lequel l'étape d'enveloppement comprend l'étape consistant à adresser l'enveloppe électronique en utilisant l'adresse électronique du dispositif de communication mobile sans fil de l'utilisateur (220).
19. Procédé selon l'une quelconque des revendications 1 à 18, dans lequel le dispositif de communication mobile sans fil de l'utilisateur (220) est un ordinateur portable.
20. Procédé selon l'une quelconque des revendications 1 à 18, dans lequel le dispositif de communication mobile sans fil de l'utilisateur (220) est un ordinateur de radiomessagerie bidirectionnelle.
21. Procédé selon la revendication 20, dans lequel l'ordinateur de radiomessagerie bidirectionnelle comprend une interface réseau sans fil pour communiquer avec le système hôte redirecteur sans fil (240) via le réseau de transmission sans fil.
22. Procédé selon la revendication 21, dans lequel l'enveloppe électronique est adressée en utilisant l'adresse du réseau de transmission sans fil de l'ordinateur de radiomessagerie bidirectionnelle.
23. Procédé selon l'une des revendications 1 à 22, dans lequel le système hôte de messagerie (230) est un fournisseur de services Internet.
24. Procédé selon la revendication 23, dans lequel les messages de données sont des messages de courrier électronique, et le fournisseur de services Internet comprend un programme de serveur de courrier.
25. Procédé selon la revendication 24, dans lequel le fournisseur de services Internet comprend en outre une base de données de transfert couplée au programme de serveur de courrier pour détecter si un message de données reçu au niveau du serveur de courrier devrait être transféré à un système hôte redirecteur sans fil (240), et pour déterminer l'adresse réseau électronique du système hôte redirecteur sans fil (240).
26. Procédé selon l'une quelconque des revendications 1 à 25, dans lequel la connexion de réseau étendu couplant le système hôte de messagerie (230) au système hôte redirecteur sans fil (240) est une connexion Internet.
27. Procédé selon l'une quelconque des revendications 1 à 26, comprenant en outre les étapes consistant à :
- configurer une base de données de profils d'utilisateur (254) pour l'utilisation par le système hôte redirecteur sans fil (240) en déterminant si le message de données devrait être redirigé vers le dispositif de communication mobile sans fil de l'utilisateur (220) ; et
 - stocker, dans la base de données de profils d'utilisateur (254), l'adresse électronique du dispositif de communication mobile sans fil de l'uti-

lisateur (220).

- 28.** Procédé selon la revendication 27, comprenant en outre l'étape consistant à :

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- stocker, dans la base de données de profils d'utilisateur (254), des informations concernant le type et la configuration du dispositif de communication mobile sans fil de l'utilisateur (220).

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- 29.** Procédé selon l'une quelconque des revendications 1 à 28, dans lequel l'étape d'envoie comprend en outre les étapes consistant à :

- convertir le message de données en un format compressé ; et 15

- placer le message de données compressé dans une enveloppe électronique adressée en utilisant l'adresse électronique du dispositif de communication mobile sans fil de l'utilisateur (220). 20

- 30.** Procédé selon l'une quelconque des revendications 1 à 29, dans lequel le message de données est un message d'événement de calendrier. 25

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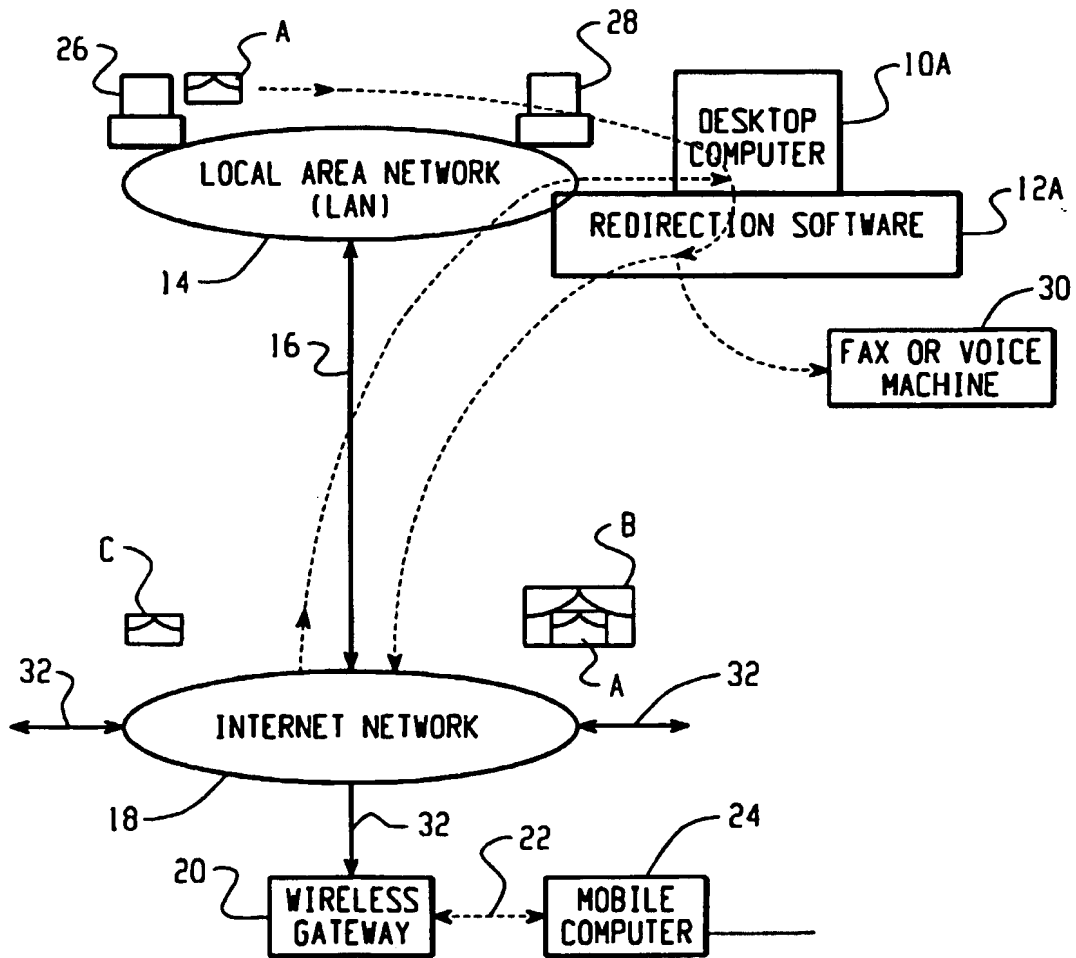


Fig. 1

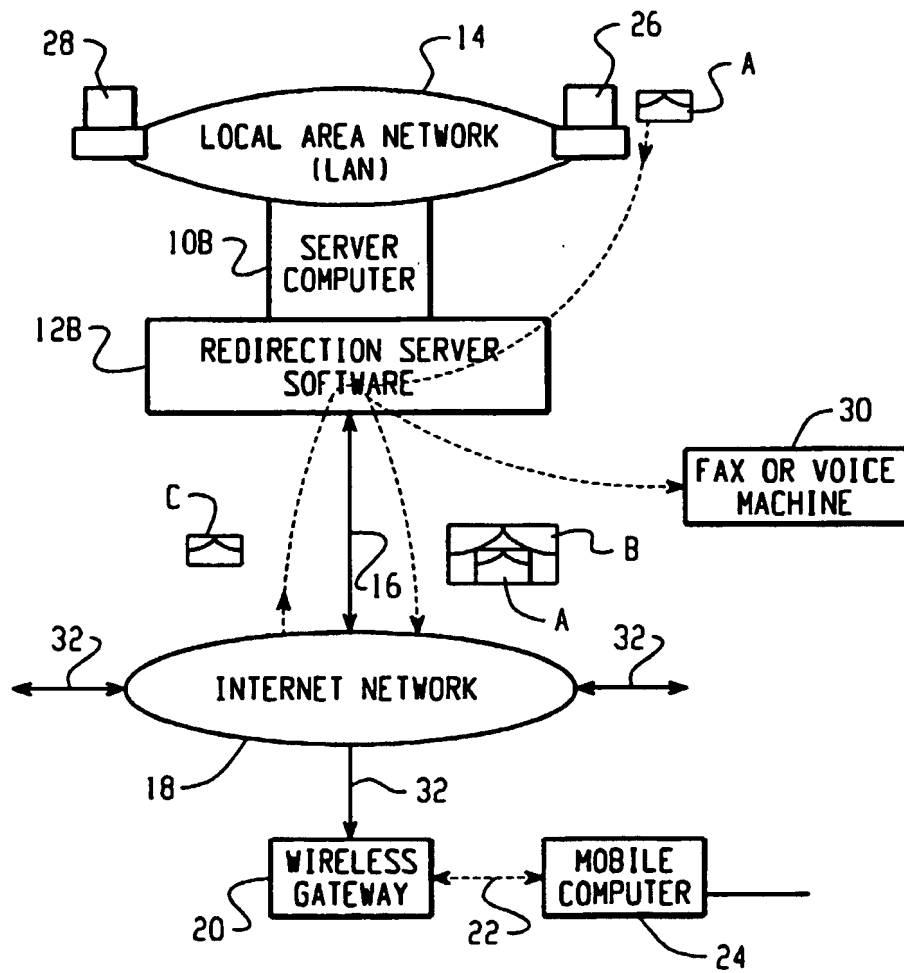


Fig. 2

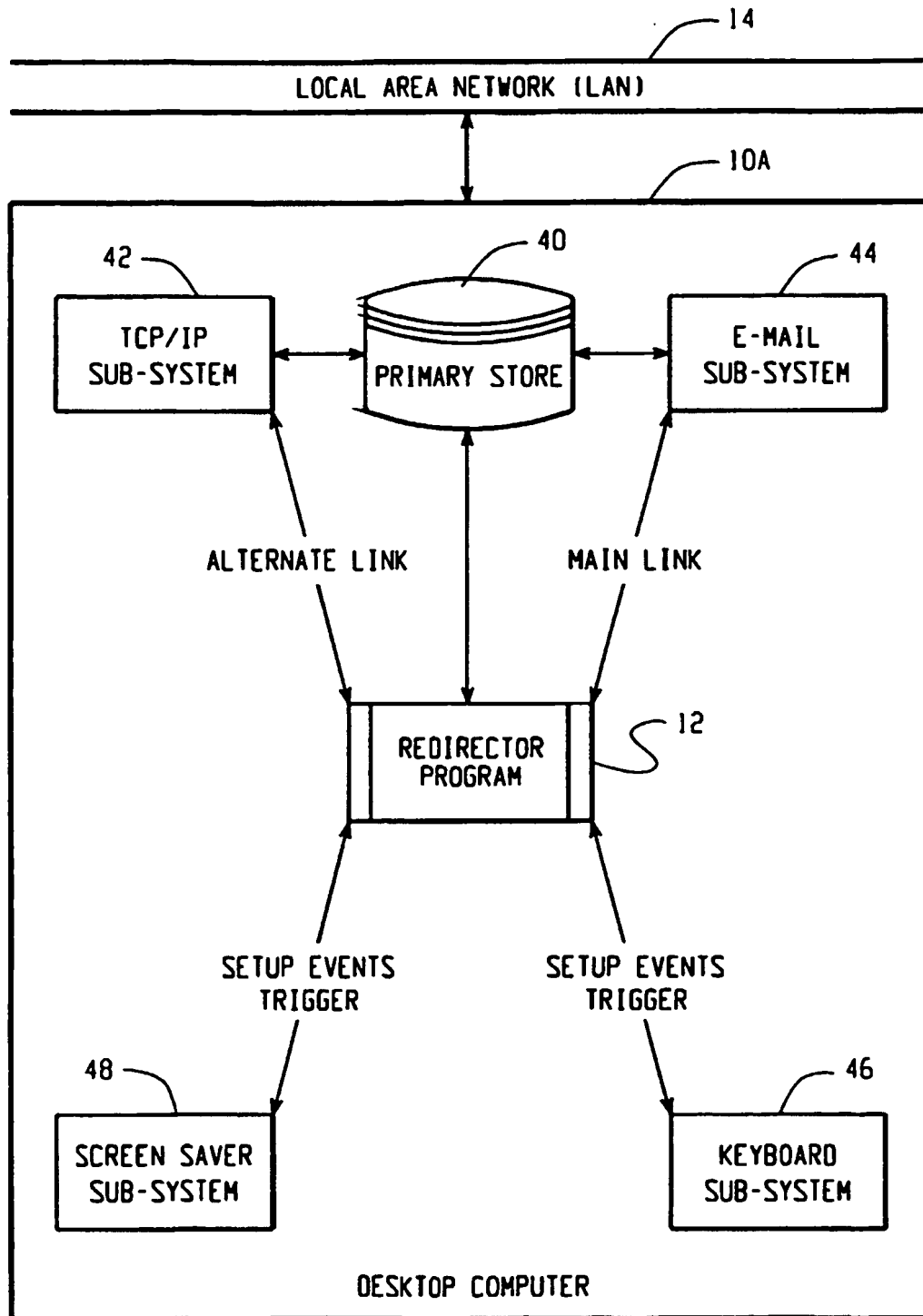


Fig. 3

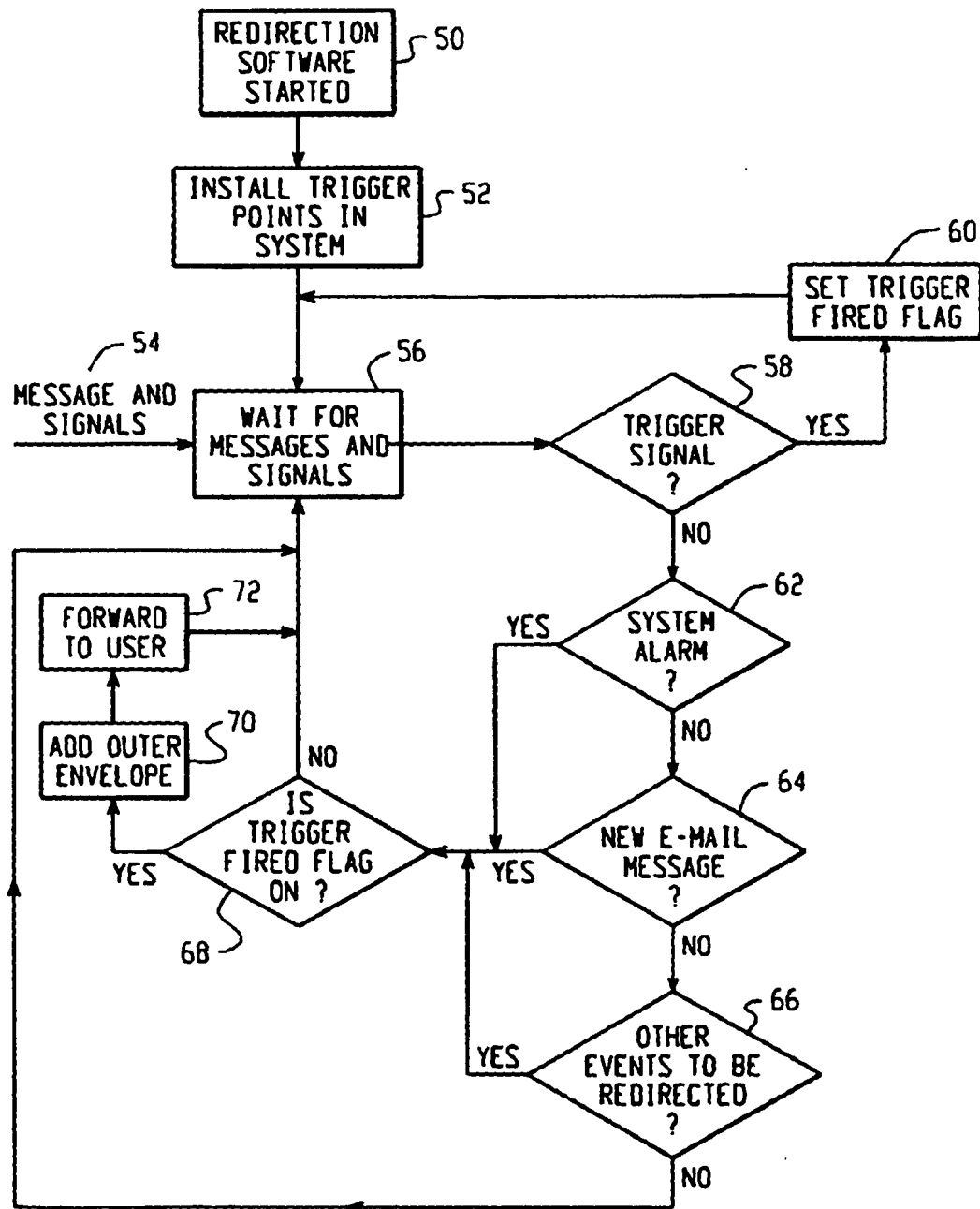


Fig. 4

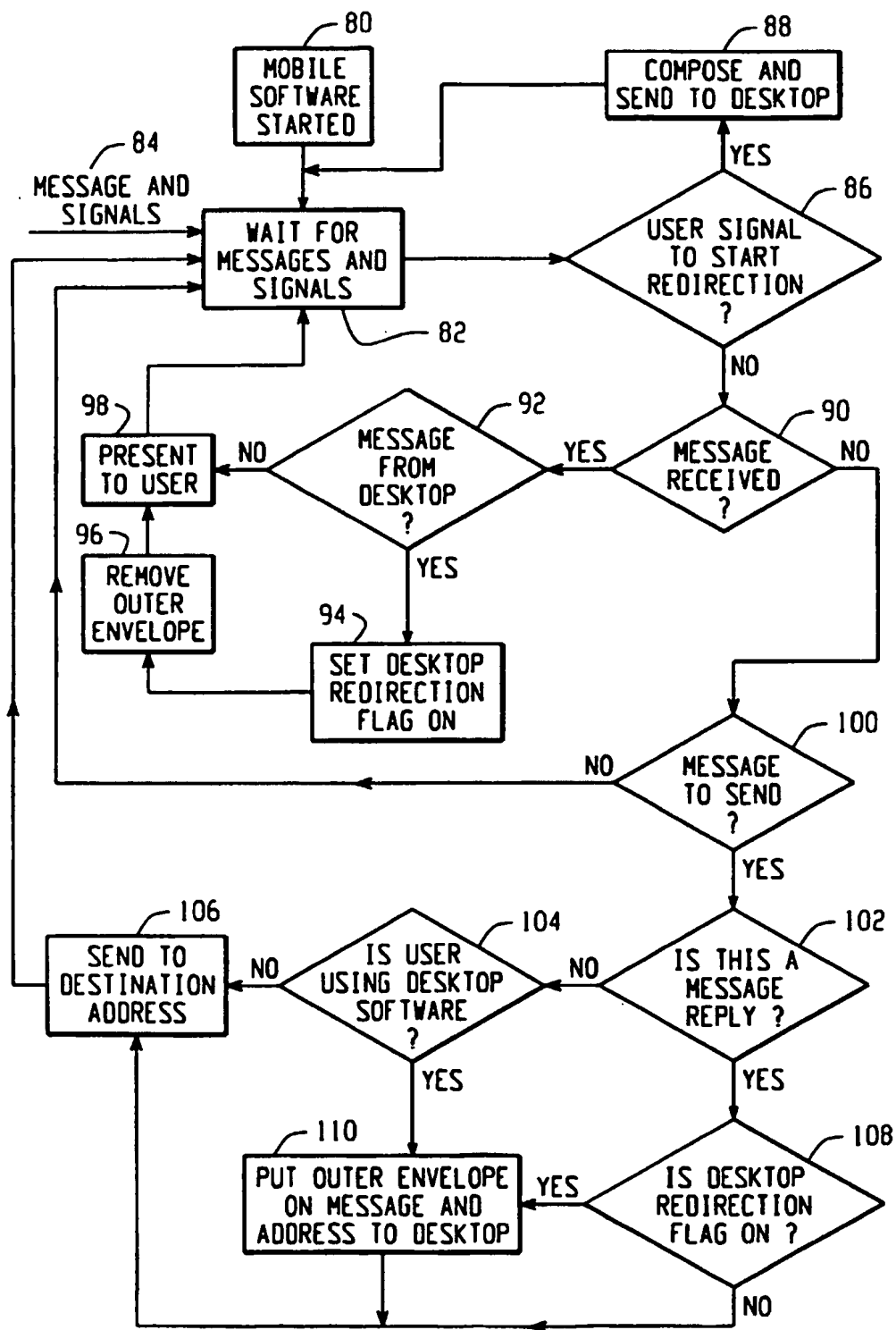
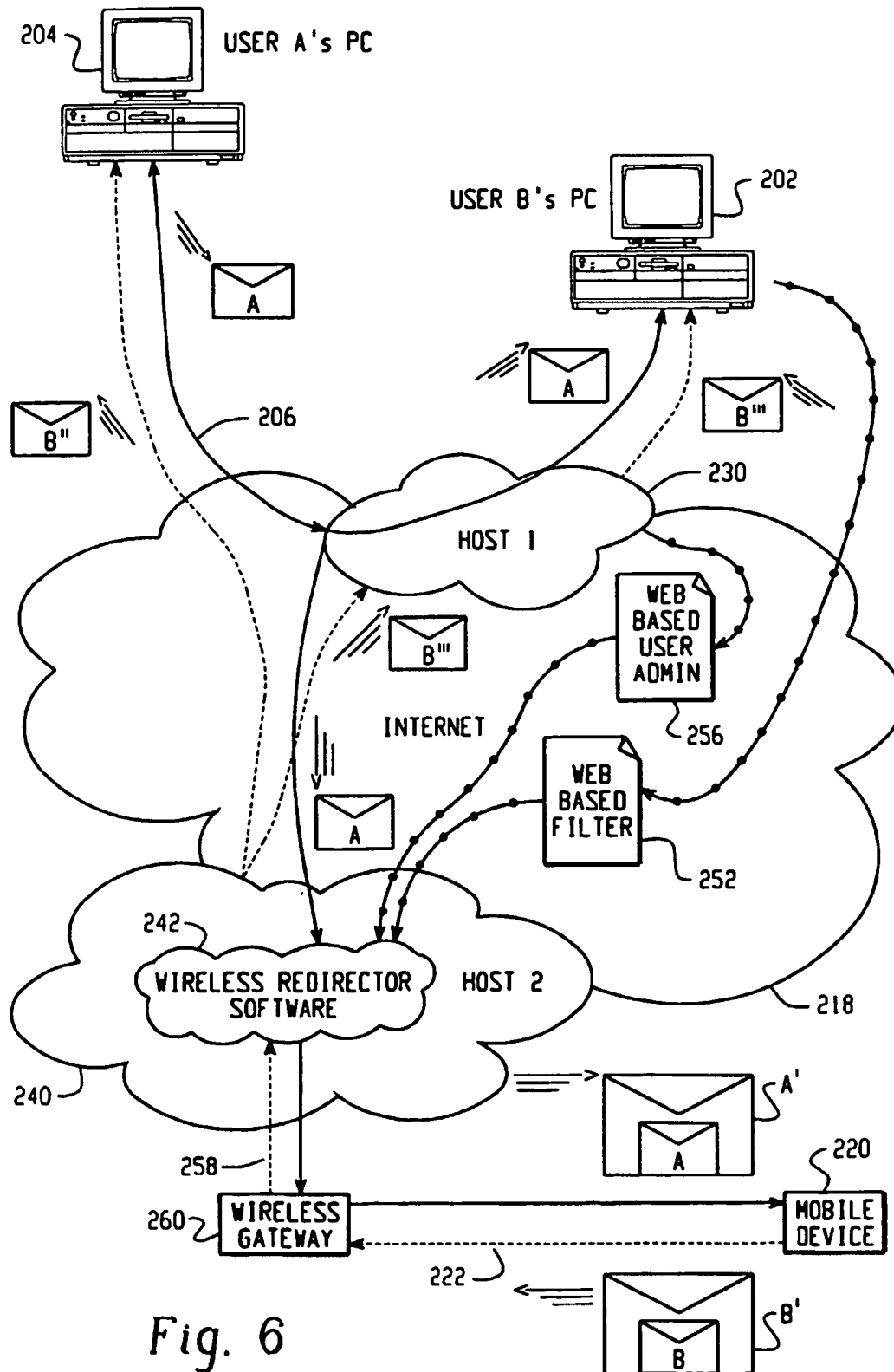


Fig. 5



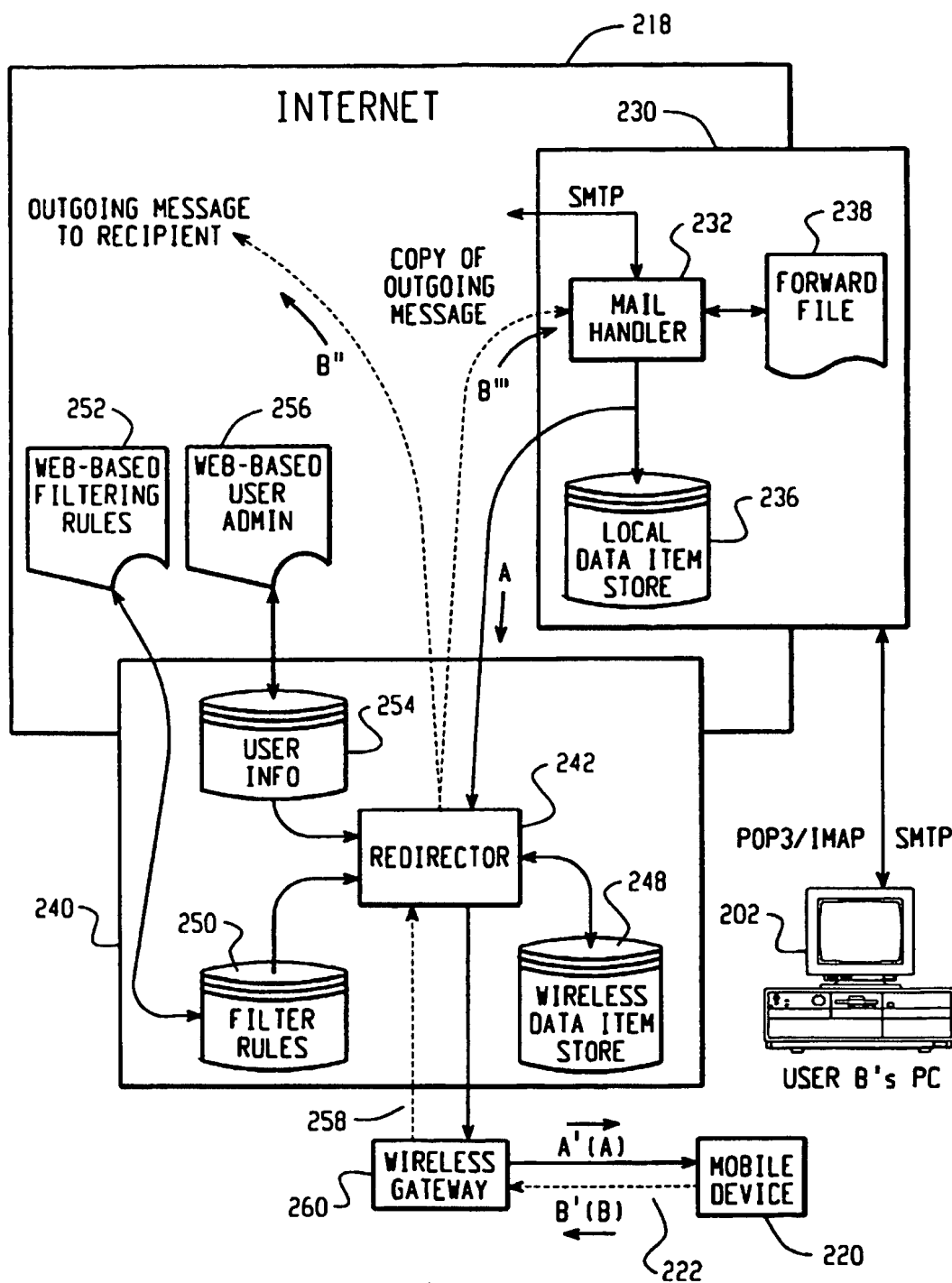


Fig. 7

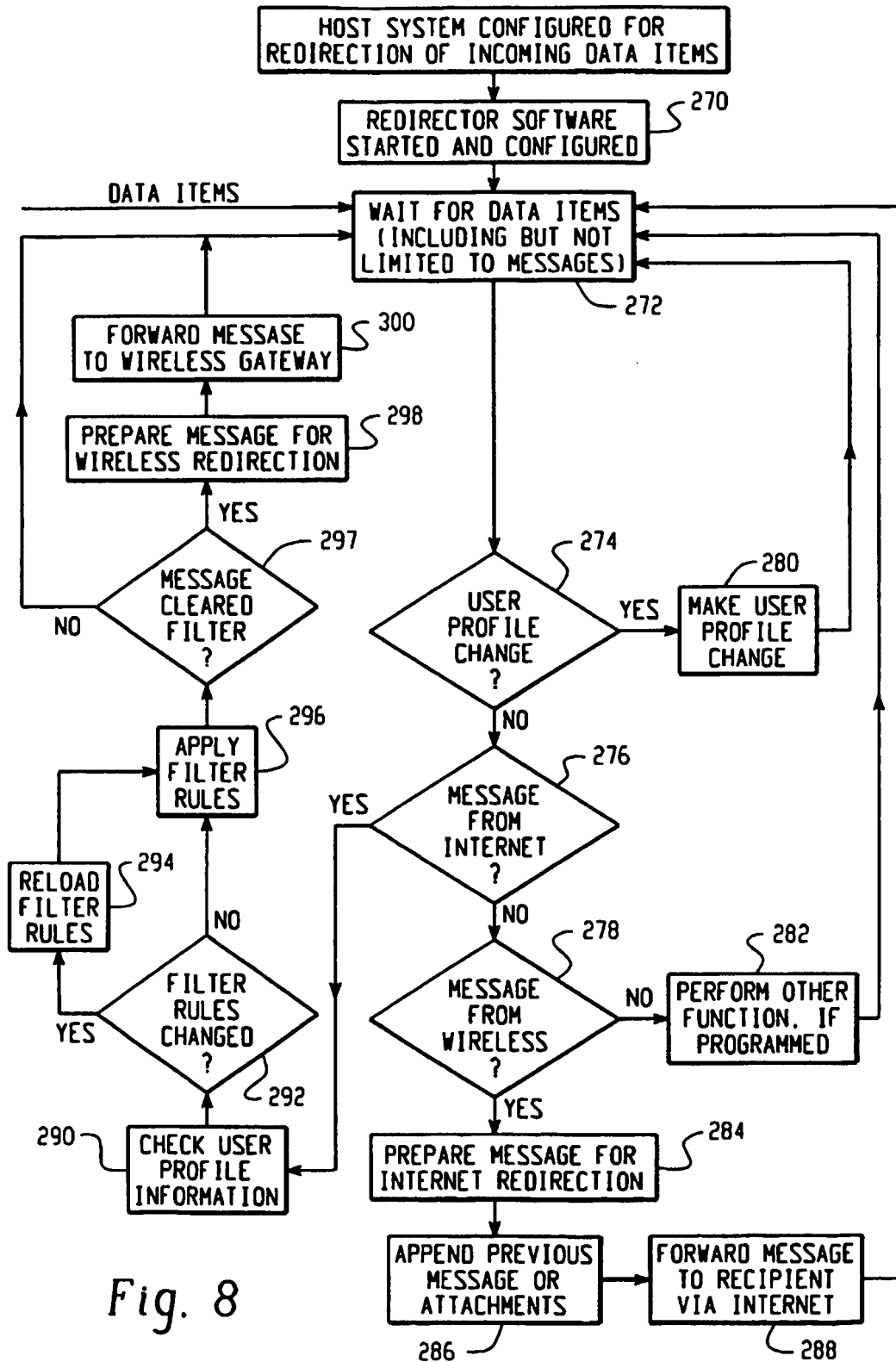


Fig. 8

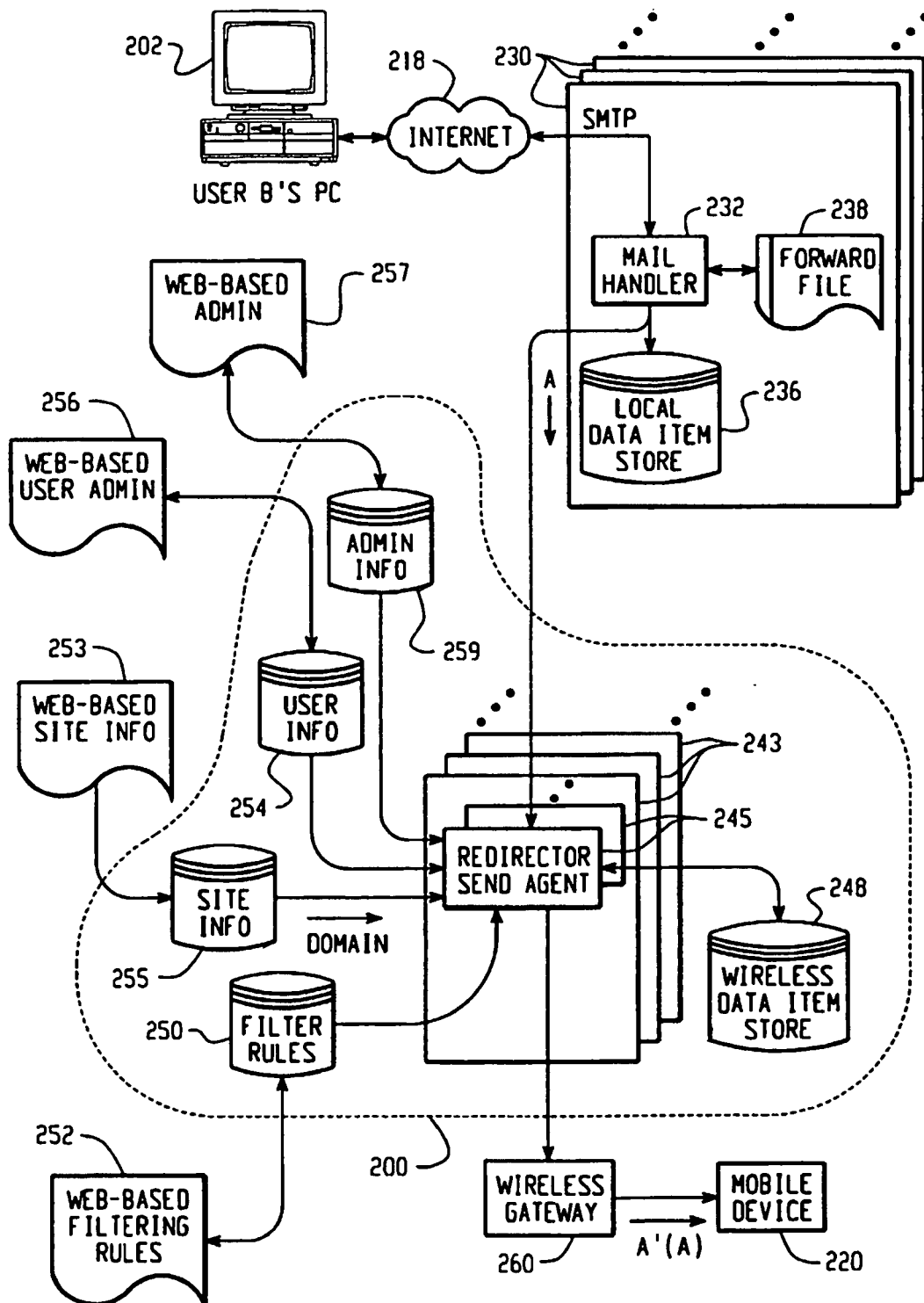


Fig. 9

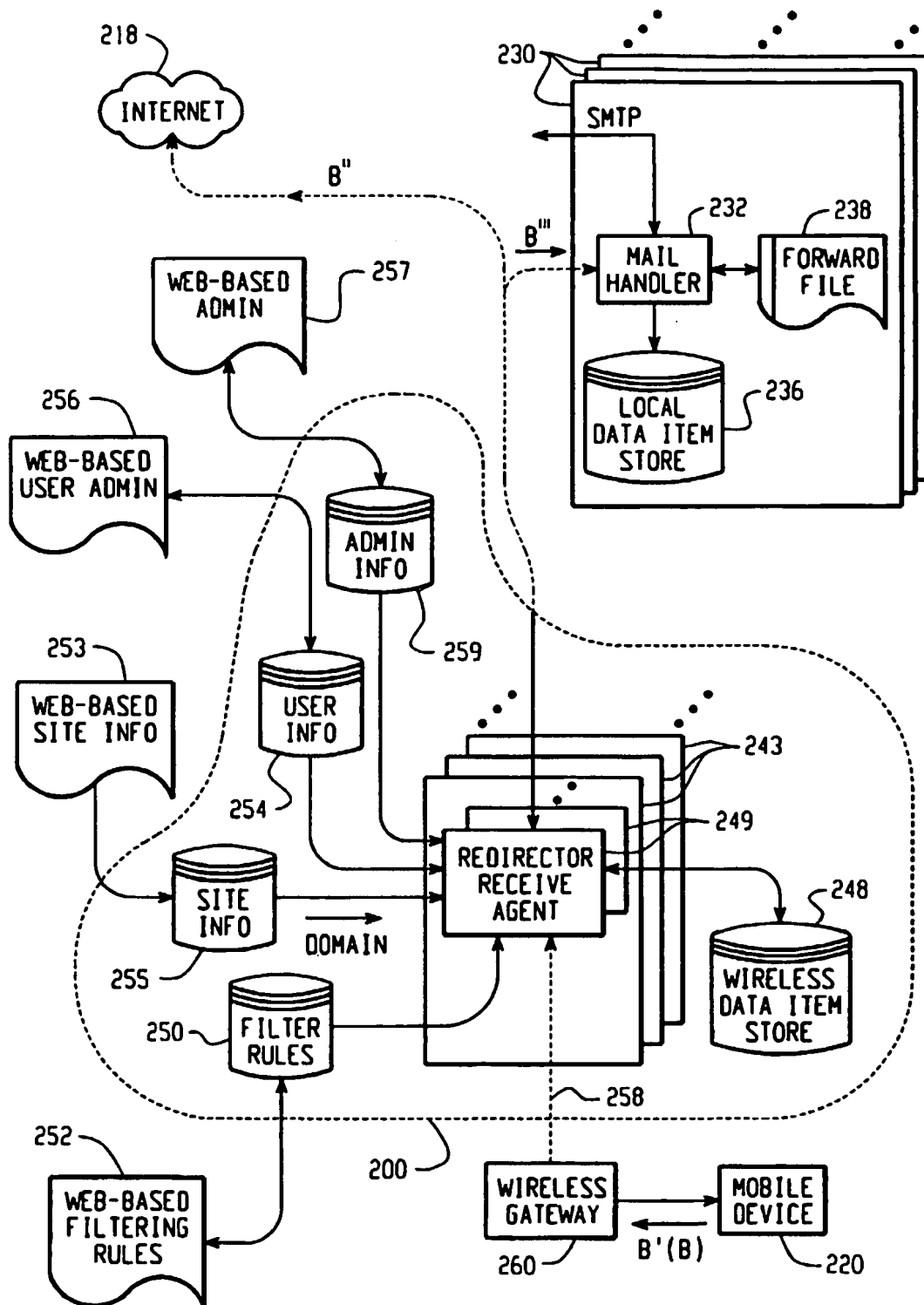


Fig. 10

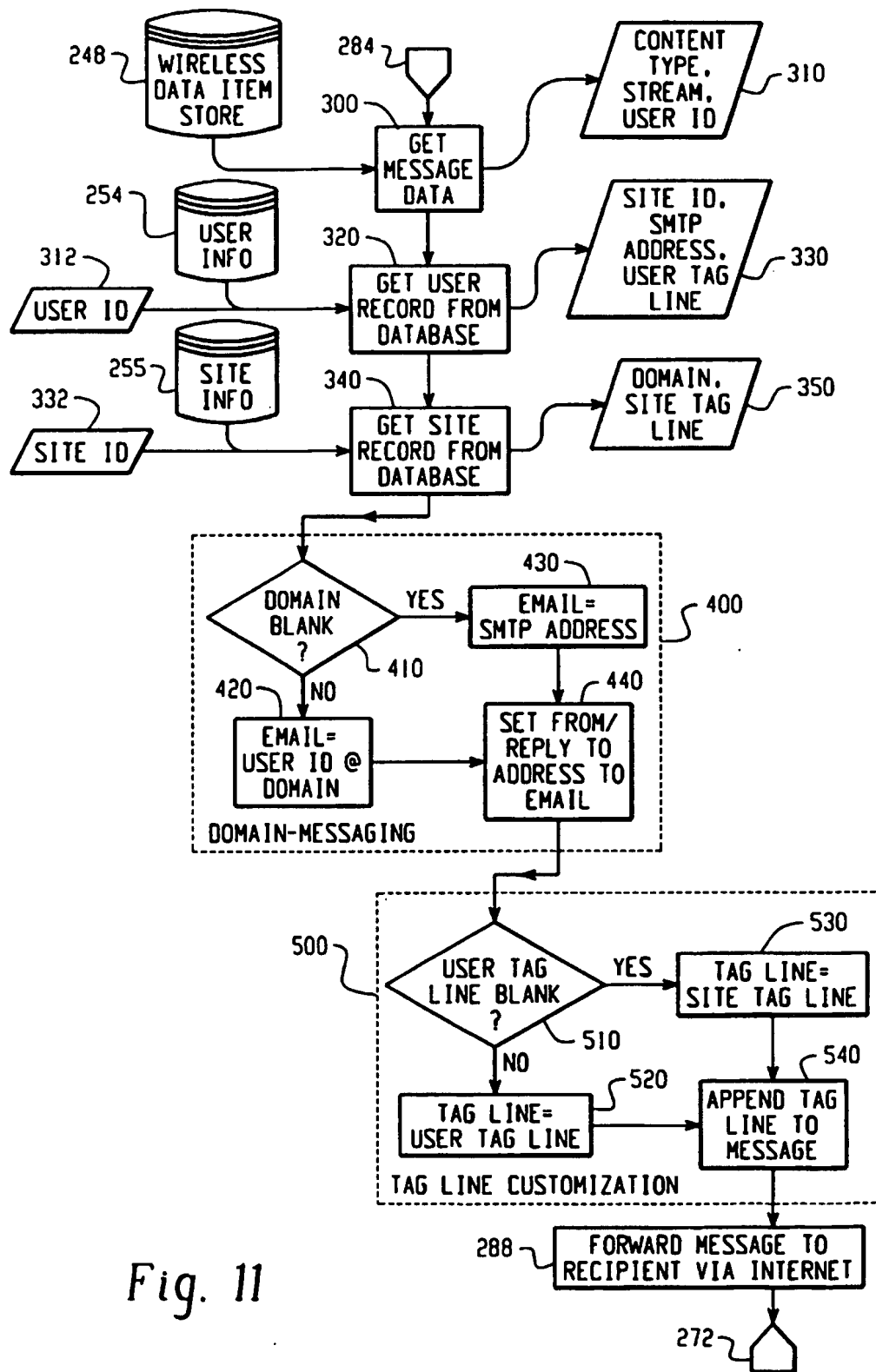


Fig. 11

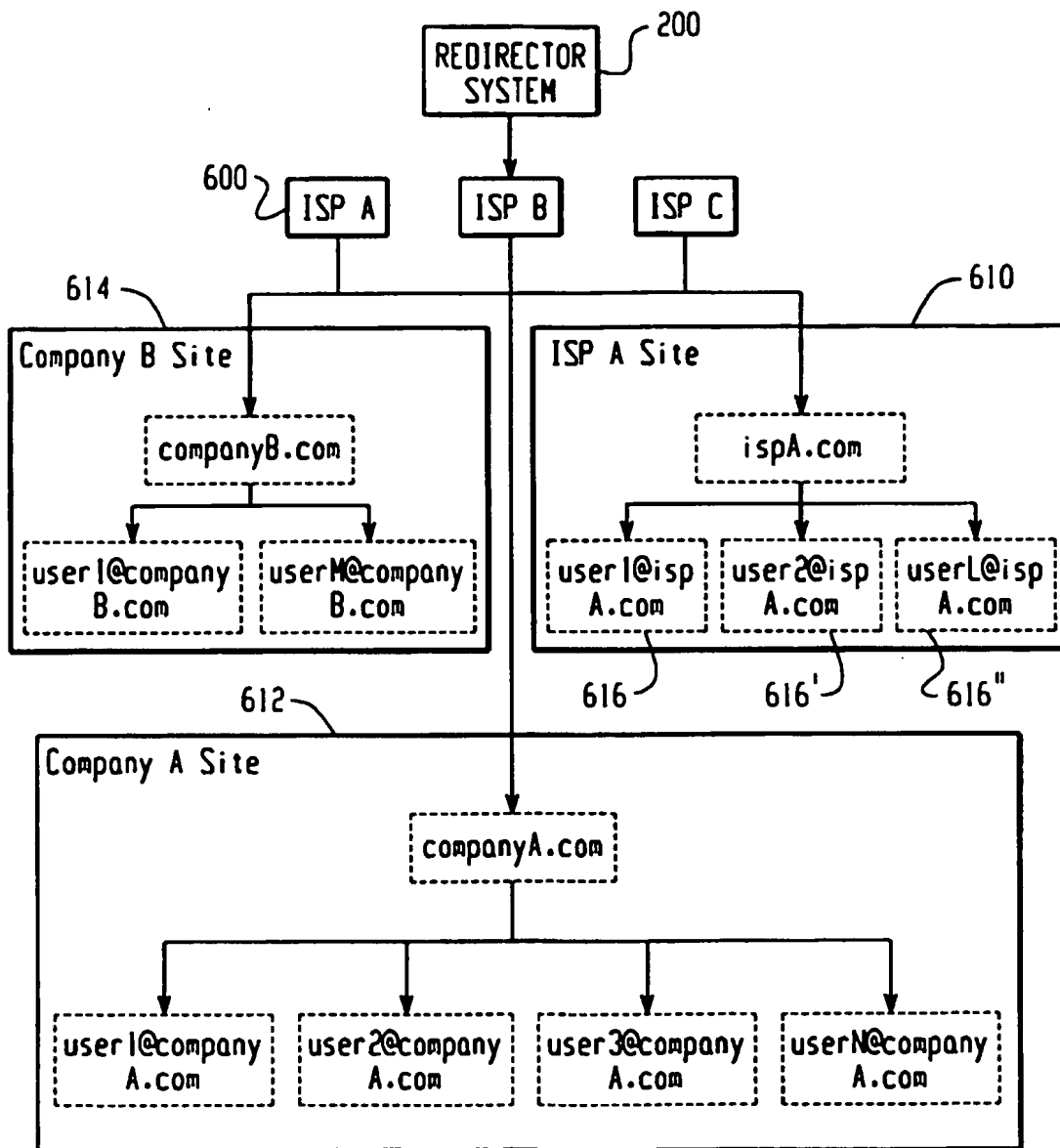


Fig. 12